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DIPHTHERIA CARRIERS *

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While carriers of diphtheria bacilli have been objects of study for many years, so much interest attaches to them as potential spreaders of infection that it may be profitable to add the results of several years' experience with such cases in a hospital for contagious diseases. A study of the manner and speed with which the bacilli disappear from the nose and throat after diphtheria throws some light on the origin of carriers, and furnishes a standard by which to estimate the value of measures directed toward the elimination and destruction of the bacilli. A study of the persons in whom the bacilli persist may lead to the detection of underlying conditions which are responsible for the carrier state and so allow efforts toward their correction to be made along intelligent lines.

For these purposes I have tabulated 500 consecutive cases of diphtheria which were treated in Durand Hospital between February, 1918, and September, 1920. Patients with laryngeal diphtheria and those who died early are excluded. The series includes fifteen cases in which operative measures were employed in getting rid of the bacilli. The frequency with which two negative cultures are followed by positive ones early led us to adopt three consecutive negative cultures taken at intervals of from one to three days from both nose and throat as a standard for release. Hartley and Martin [1] have estimated that the average stay in hospital of patients with diphtheria released on one negative culture would be twenty-one days; on two negative cultures, thirty-four days; and on three negative cultures, forty-five days. In this discussion cases are considered as having been negative on the day when the first of three successive negative cultures was secured. If more than one day intervened between the last positive and the first of three negative cultures, the day of the first negative culture has been placed midway between the two.

It will be noted (Table 1) that after the first week, approximately half of the cases that began any week as positive became negative during the following seven days. Three weeks after the onset, 71.2 per cent. of the cases had become negative. At the end of four weeks, 83.2 per cent. were free of bacilli; and after seven weeks, less than 1 per cent. yielded positive cultures. In only a single instance were cultures positive after eleven weeks.

The outcome in the fifteen persons who were operated on if there had been no operation cannot be predicted. Of the 500 patients, eighty-four, or 16.8 per cent., became carriers, that is, gave positive cultures after twenty-eight days.

The number of cases that were positive at five day intervals is graphically shown in the accompanying chart. Hartley and Martin [1] have pointed out that diphtheria bacilli disappear from the throat with such regularity that the rate may be expressed by a mathematical formula. The rate of disappearance of the bacilli in our 500 cases and in the 457 cases of Hartley and Martin is shown in Table 2.

Differences in the percentages in the two series may depend in part on the intervals at which cultures were made, opportunities for reinfection and the character of the material. The patients of Hartley and Martin were all young adults in a military camp, and the cultures were made at weekly intervals, while ours were of all ages with little opportunity for reinfection, and the cultures were made at shorter intervals. The greater rapidity with which our cases became negative may perhaps be partly due to the constant efforts put forth to remove local conditions favoring the persistence of the bacilli. In both series the decrease of positive cases occurred with considerable regularity. After five days from the onset, of each 100 cases which are positive at any time, five or six may be expected to become negative within twenty-four hours.

During 1913 to 1920, fifty-two patients entered Durand Hospital as carriers and were observed until free from bacilli with no operative interference. Of these, 55.8 per cent. were free of bacilli after two weeks, and 80.8 per cent. after four weeks. The rate of disappearance of the bacilli did not show any such regularity as was observed in the series following diphtheria (Table 3). Of the fifty-two patients, nineteen had been in contact with diphtheria, and twelve gave histories of recent sore throat. The bacilli were located in the nose in nine, in two of which there was an associated foreign body in one nostril.

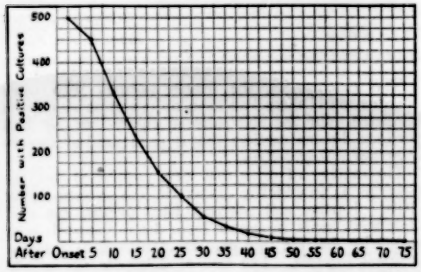
In ten of the fifty-two patients the bacilli persisted longer than four weeks. In four of these, cultures were obtained from the pharynx only, in one from the nose alone, and in four from both pharynx and nose. The persistent pharyngeal cultures were associated with abnormal tonsils, usually enlarged, with deep crypts and roughened surface. In the nasal cases there were discharges associated with enlarged adenoids and chronic rhinitis, usually secondary to accessory sinus disease. Cultures from six of these patients were tested for virulence, and a single one was nonvirulent. The most persistent carrier of this group was a baby of 4 months with a nasal discharge. He was very cachetic, had a

* From the John McCormick Institute for Infectious Diseases.

1. Hartley and Martin: Proc. Roy. Soc. Med., Sec. Epid. and State Med. **13**: 277, 1920.

negative Schick test constantly, and the cultures were virulent for guinea-pigs for eleven months, the last test preceding their final disappearance a few days.

Another patient was a boy of 6 years, from one of whose nostrils virulent diphtheria bacilli had been cultivated for more than two months. When a solution of epinephrin was sprayed into the nostril, preliminary to further examination, a cherry pit dropped out. Two days later the cultures became negative. One adult who had been a constant carrier of virulent bacilli for five



The part of 500 cases of diphtheria which gave positive cultures at the end of five day periods.

weeks and refused tonsillectomy developed an acute tonsillitis, during which the bacilli disappeared. In other instances we have observed a disappearance of diphtheria bacilli during an acute tonsillitis. It seems quite reasonable that acute swelling with passage into the tonsils of abundant blood and escape of active leukocytes and opsonin might be followed by destruction of the bacilli. In a similar manner we may explain some favorable results reported to follow hyperemia produced by local applications of agents of an irritating nature. Two additional patients entered the hospital as carriers with no history of recent illness. They became free of bacilli one and eight days, respectively, after tonsillectomy.

As is the case with many bacteria, the largest factor in the removal of diphtheria bacilli from the body appears to be destruction by leukocytes. An essential factor in this process of phagocytosis is suitable opsonin. Tunnicliff [2] has shown that, in the course of diphtheria, immune opsonins for diphtheria bacilli appear in the blood in considerable amount. They may be detected on the fourth or fifth day of the disease, and they remain at their height until about the tenth to the fifteenth day and then gradually decrease, reaching normal about the nineteenth or twentieth day. The period during which the amount of opsonin in the blood is greatest corresponds to the time when the largest number of persons with diphtheria become free of bacilli. Of the 500 cases tabulated herewith, more than 70 per cent. got rid of their bacilli within three weeks from the onset.

In diphtheria carriers also Tunnicliff [3] found the phagocytic power of the blood for diphtheria bacilli increased. In spite of this, bacilli may persist in the throat and nose. This seems usually dependent on local conditions which interfere with suitable contact of the specific destructive agents and the bacilli.

2. Tunnicliff, Ruth: J. Infect. Dis. **5**: 14, 1908.
3. Tunnicliff, Ruth: J. Infect. Dis. **19**: 97 (July) 1916.

Gelien, Moss and Guthrie [4] attempted by direct introduction of large numbers of diphtheria bacilli into the nasal passages to produce carriers in cats, guinea-pigs and rabbits. The bacilli rapidly disappeared, and nothing corresponding to carriers as seen in man was observed.

These local conditions may result from secondary infections with abrasions and ulcerations of the mucous membranes and inflammations of accessory sinuses with imperfect drainage, and from mechanical injury by foreign bodies with associated infections. In tonsillar carriers, Brown [5] found diphtheria bacilli in certain areas where the surface epithelium of the tonsil was necrotic. Keefer, Friedberg and Aronson [6] demonstrated diphtheria bacilli in the submucosa of a tonsil from the surface of which a pure culture had been previously obtained. Hartley and Martin [1] saw diphtheria bacilli in sections of tonsils deep in the crypts but not invading the tissues. In one of our cases there was an ulceration of the mucous membrane of the turbinated body in the nostril from which diphtheria bacilli were constantly cultivated. Local treatment of the ulcer was promptly followed by disappearance of the bacilli. In two cases persistent positive cultures from one nostril were promptly terminated by the removal of foreign bodies from the nose; in one a shoe button, in the other a cherry pit. In a search for diphtheria carriers among 400 institutional children, Rabinoff [7] found five children, with shoe buttons in the nose, who were carriers. The cultures became negative after removal of the buttons. Bloomfield [8] attempted to produce human carriers of Friedländer's bacillus by artificial inoculation, but failed. He concludes from his study that the carrier state depends on a focus of diseased tissue which affords a breeding place for the bacteria. When we consider the circumstances under

TABLE 1.—RATE OF DISAPPEARANCE OF DIPHTHERIA BACILLI BY WEEKS FROM THE NOSE AND THROAT OF FIVE HUNDRED PATIENTS WITH DIPHTHERIA*

Week After Onset	Cases at Beginning of Week (Excluding Patients Operated on During Week)	Cases Becoming Negative During Week (Excluding Patients Operated on)	Cases Becoming Negative During Week per Hundred at Beginning	Cases Becoming Negative During Week per Hundred of Total Cases
1	500	103	20.6	20.6
2	397	157	39.5	31.4
3	240	96	40.0	19.2
4	143 (144—1)	60	41.9	12.0
5	75 (83—8)	37	49.3	7.4
6	35 (38—3)	20	57.1	4.0
7	14 (15—1)	9	64.4	1.8
8	4 (5—1)	1	25.0	0.2
9	3	1	33.3	0.2
10	2	1	50.0	0.2
11	0 (1—1)	0	0.0	0.0

* Patients operated on are deducted from those at the beginning of the week during which they came to operation.

which diphtheria bacilli persist in the throat and nose, it is not surprising that of all the local washes, sprays, gargles, etc., none has proved of marked value in persistent carriers. They seem to be useful so far as they remove secretions and exudates, and facilitate the cor-

4. Gelien, Moss and Guthrie: Bull. Johns Hopkins Hospital **31**: 381, 1920.
5. Brown, M. W.: J. Infect. Dis. **19**: 565 (Oct.) 1916.
6. Keefer, F. R.; Friedberg, S. A., and Aronson, J. D.: A Study of Diphtheria Carriers in a Military Camp, J. A. M. A. **71**: 1206 (Oct. 12) 1918.
7. Rabinoff, Sophie: The Problem of Diphtheria Carriers, J. A. M. A. **67**: 1722 (Dec. 9) 1916.
8. Bloomfield: Bull. Johns Hopkins Hosp. **32**: 10 (Jan.) 1921.

rection of underlying local conditions. The administration of diphtheria antitoxin has been of no advantage, and practically all carriers have considerable antitoxin in the blood.

TABLE 2.—RATE OF DISAPPEARANCE OF DIPHTHERIA BACILLI IN FIVE DAY PERIODS

FROM NOSE AND THROAT IN FIVE HUNDRED CONSECUTIVE CASES OF DIPHTHERIA AT DURAND HOSPITAL

Day After Onset	Positive Cases at the Beginning of Period (Less Patients Operated on During Period)	Cases Becoming Negative During Period of Five Days (Excluding Patients Operated on)	Cases Becoming Negative During Period of Five Days per Hundred at Beginning	Cases Becoming Negative per Day of Period per Hundred at Beginning
5	500	47	9.4	1.9
10	453	124	27.4	5.5
15	329	100	30.4	6.1
20	229	75	32.8	6.6
25	154	51	33.1	6.6
30	101 (103—2)	38	37.7	7.5
35	56 (63—7)	18	32.1	6.4
40	35 (38—3)	15	42.9	8.6
45	19 (20—1)	10	52.7	10.5
50	9	4	44.4	8.9
55	4 (5—1)	1	25.0	5.0
60	3	1	33.3	6.7
65	2	0	.....	.....
70	2	1	50.0	10.0
75	0 (1—1)	0	.....	.....

FROM THROAT IN FOUR HUNDRED AND FIFTY-SEVEN CASES OF DIPHTHERIA REPORTED BY HARTLEY AND MARTIN

Day After Onset	Positive Cases at the Beginning of Period	Cases Becoming Negative During Period of Five Days	Cases Becoming Negative During Period of Five Days per Hundred at Beginning	Cases Becoming Negative per Day of Period per Hundred at Beginning
5	457	65	14.2	2.8
10	392	90	23.0	5.0
15	302	70	23.2	4.6
20	232	38	16.4	3.3
25	194	38	19.6	3.9
30	156	38	24.4	4.9
35	118	26	22.0	4.4
40	92	22	23.9	4.8
45	70	18	25.7	5.1
50	52	11	21.5	4.3

The local use of antitoxic serum and of serum produced by immunizing with the bacterial bodies has not been followed by any satisfactory results. Vaccines have not been of any certain value, and this was to be expected, as carriers usually have an abundant supply of opsonins and their blood leukocytes are active.

Our efforts to clean up carriers are now confined to such measures as aid in removing local conditions that favor the retention of the bacilli. Washes are employed to remove secretions and discharges. Measures are used to facilitate drainage from the accessory sinuses and the nostrils. Irritating solutions are especially avoided. When the bacilli persist after such treatment, operative procedures are instituted if the localization of the bacilli is such that any benefit can be expected. The operations performed have been tonsillectomy and, when the adenoids are enlarged, adenoidectomy. Early disappearance of the bacilli has followed the operations in every case. The first case came to operation in June, 1915. To Dec. 31, 1920, forty patients had been operated on. In all cases the tonsils were enucleated, and in five adenoids were also removed. All of the patients had clinical diphtheria in the hospital, and the operation followed from twenty-one to seventy-three days after the onset. After operation the bacilli usually disappear very promptly. In many, no positive cultures could be secured after the operation. All except four were negative within a week, and only one was as long as eighteen days in becoming negative (Table 4). The only complication observed was a moderate secondary hemorrhage in one case on the sixth day.

The first six in our series of operative cases were reported by Friedberg.[9] Shortly afterward Ruh, Miller and Perkins[10] reported favorable results from tonsillectomy and adenoidectomy in carriers. Among their nineteen cases a single one was as long as seventeen days in becoming negative. In a large army camp, Keefer, Friedberg and Aronson[6] employed tonsillectomy to clear up carriers. Of 294 persons operated on, 91.3 per cent. were negative by the end of two weeks. From other army camps favorable results from tonsillectomy were reported. Pegler,[11] in 1905, reported the removal of tonsils and adenoids to get rid of lingering bacilli. Since this appeared only in a discussion on diphtheria and not as an original communication, it was apparently overlooked by American writers. Hartley and Martin[1] have found that the best treatment of carriers with large tonsils and deep crypts is radical enucleation of the tonsils. Friedberg pointed out the fact that the tonsil harboring the bacilli need not be enlarged. We advise removal of the tonsils and enlarged adenoids at the end of a month if the bacilli persist, or as soon afterward as the general condition of the patient warrants. In small children, in whom prolonged isolation is not very objectionable and in whom operative measures are less satisfactory, we are accustomed to wait for the natural disappearance of the bacilli, making use of such local measures as seem indicated. When the bacilli persist in the nose, local

TABLE 3.—RATE OF DISAPPEARANCE OF DIPHTHERIA BACILLI FROM THE THROAT AND NOSE IN FIFTY-TWO CARRIERS*

Days in Hospital	Positive Cases at Beginning of Period	Cases Becoming Negative During Period of Five Days	Cases Becoming Negative During Period of Five Days per Hundred at Beginning	Average Number of Cases Becoming Negative per Day of Period
5	52	17	32.7	6.5
10	35	9	25.7	5.1
15	26	4	15.4	3.1
20	22	3	13.6	2.7
25	19	7	36.8	7.4
30	12	2	16.7	3.3
35	10	1	10.0	2.0
40	9	2	22.2	4.4
45	7	1	14.3	2.9
50	6	1	16.7	3.3
55	5	0	0.0	0.0
60	5	2	40.0	8.0
65	3	0	0.0	0.0
70	3	1	33.3	6.7
75	2	1	50.0	10.0

* One case persisted for eleven months.

TABLE 4.—RATE OF DISAPPEARANCE OF DIPHTHERIA BACILLI AFTER OPERATION

Day After Operation When Cultures Were Negative	Number of Cases
1	7
2	7
3	2
4	8
5	9
6	1
8	1
9	2
18	1

9. Friedberg, S. A.: Removal of Tonsils and Adenoids in Diphtheria Carriers, J. A. M. A. **66**: 810 (March 11) 1916.
10. Ruh, H. O.; Miller, M. J., and Perkins, R. G.: Studies on Diphtheria, J. A. M. A. **66**: 941 (March 25) 1916.
11. Pegler: Brit. M. J. **2**: 651, 1905.

lesions in the nostrils, and in children foreign bodies, are looked for.

One of the earliest efforts to determine the frequency of diphtheria carriers among well persons was made by a committee of the Massachusetts Association of Boards of Health [12] in 1902. The report of the committee was based on the results of a cooperative study which it instituted and which was participated in by a number of well qualified investigators. They concluded that in urban communities at least 1 or 2 per cent. of well persons among the general public are infected, and that when well persons are exposed to diphtheria, as in families, schools or institutions in which cases of diphtheria exist, the number infected is much larger, and may range from 8 to 5 per cent. Graham-Smith [13] reviewed the findings of various investigators as to carriers. The available data indicated that in close contacts the proportion of carriers may be as high as 36.6 per cent., in hospital wards and institutions 14 per cent. and among scholars of infected schools 8.7 per cent. I [14] found that 15.2 per cent. of the nurses in a hospital for contagious diseases became carriers, as detected by biweekly cultures extending over a period of two years.

Hachtel and Bailey [15] cultivated diphtheria bacilli from the throat and nose of 9.86 per cent. of contacts.

Goldberger, Williams and Hachtel [16] in the city of Detroit examined 4,093 apparently healthy persons with no history of contact, of whom thirty-eight, or 0.928 per cent., harbored morphologically diphtheria bacilli.

Gelien, Moss and Guthrie [4] made a cultural study of the throat in 2,507 presumably healthy individuals most diverse as to age, sex, race and social position in the city of Baltimore. Diphtheria bacilli were cultivated from eighty-nine, or 3.55 per cent. Later they added the results of cultures from 800 schoolchildren, of whom eighty-five, or 10.62 per cent., were positive for diphtheria bacilli.

These and other studies have established the fact that diphtheria bacilli, as recognized by cultures, are present in the throat and nose of a considerable proportion of healthy persons, and in a much larger proportion of those who have been closely associated with cases of diphtheria.

Supplemental studies, however, have determined that only a small part of the bacilli from noncontacts are virulent and a source of danger to other persons. Of the strains from noncontacts or "healthy" carriers, the proportion of virulent ones as determined by the committee of the Massachusetts Association of Boards of Health [12] was about 17 per cent.; by Goldberger, Williams and Hachtel,[16] 10.5 per cent., and by Gelien, Moss and Guthrie [4] from 10.9 to 18.1 per cent. These results appear to show that the proportion of individuals who have not knowingly been in contact with diphtheria but who are carriers of virulent diphtheria bacilli varies from about 1 in 75 to 1 in 1,030. There appears to be considerable variation in different communities, and the higher proportion occurs among children of school age. Such a proportion of unsuspected carriers of virulent bacilli, scattered among the people of cities, offers a ready explanation of the endemic presence of diphtheria and emphasizes the difficulty of eradicating the disease.

In distinction to the bacilli from "healthy" or noncontact carriers, those cultivated from persons who have recently had diphtheria, "convalescent" carriers, or those who have been in contact with cases of diphtheria, "contact" carriers, are virulent in a large proportion.

The committee of the Massachusetts Association of Boards of Health [12] decided that bacilli from persons who had been in close contact with cases of diphtheria are usually virulent. I [14] concluded from my study that such cultures were practically always virulent. Utheim [17] found cultures from seventy-nine convalescents and eleven carriers uniformly virulent.

Hachtel and Bailey [15] found ninety-seven out of 100 cultures from immediate contacts to be virulent. Wadsworth [18] found cultures from convalescent carriers virulent in 92.5 per cent., and from contact carriers in 80 per cent.

The part that carriers play in the spread of diphtheria is doubtless considerable. The transfer of bacilli from a carrier to a susceptible person may originate a case of clinical diphtheria, and to immune persons may multiply the numbers of carriers which again become potential spreaders of the disease. There is little evidence that the bacilli lose their virulence to any considerable degree when they reside in the throat and nose of a carrier, even for a long time.

What to do with diphtheria carriers is a difficult problem for those dealing with public health matters. In this, as in many other instances, the first effort is to be directed toward prevention, especially by isolation of cases of diphtheria, and by the protection of attendants from infection. Immunization with diphtheria antitoxin of contacts who are susceptible to infection, as determined by the Schick test, limits the cases of diphtheria. It does not prevent the production of carriers. To prevent the transfer of bacilli from the sick to those about requires the application of a technic that often cannot be carried out because of lack of intelligent appreciation and training. The use of properly constructed gauze masks by those in contact with cases of diphtheria will doubtless limit the danger of infection.

Gelien, Moss and Guthrie found that 52.94 per cent. of schoolchildren with positive cultures had pathologic throat conditions, as compared with 36.32 per cent. among children with negative cultures. It is likely that diseased tonsils, enlarged adenoids and infected nasal sinuses will render the individual more suitable for a carrier. The correction of such local conditions should reduce the likelihood of contraction of diphtheria and especially of becoming a carrier.

When an individual has become a carrier, the measures to be instituted should vary according as the bacilli are or are not virulent. In all noncontact carriers the virulence of the bacilli should be tested. This allows most such individuals to be dismissed as not dangerous to others. "Convalescent" and "contact" carriers must always be considered sources of danger. If the carriage is persistent, a test of virulence will occasionally reveal a nonvirulent bacillus and allow the possessor to be released from restraint.

Persistent carriers of virulent bacilli generally present some local pathologic condition in the throat or

12. J. Massachusetts Assn. of Boards of Health, 1902, p. 1202.
13. Nuttall and Graham-Smith: Bacteriology of Diphtheria, 1908, p. 187.
14. Weaver, G. H.: J. Infect. Dis. **20**: 125 (Feb.) 1917.
15. Hachtel, F. W., and Bailey, M. S.: Am. J. Pub. Health **10**: 42 (Jan.) 1920.
16. Goldberger, Williams and Hachtel: Bull. 101, Hyg. Lab., U. S. P. H. S., 1915, p. 29.
17. Utheim, K.: Norsk Magazin f. Lægevidensk. **79**: 678, 1918; abstr., J. A. M. A. **71**: 695 (Aug. 24) 1918.
18. Wadsworth, A. B.: Virulence of Diphtheria Bacilli from Diphtheria Patients and from Carriers, J. A. M. A. **74**: 1633 (June 12) 1920.

nose, the correction of which is usually followed by disappearance of the bacilli. No satisfactory means has been devised for destroying the bacilli. When local measures are of value it is usually because they aid in correcting abnormal conditions which interfere with the destruction of the bacilli by the natural bactericidal processes of the body. If such local treatment has been unsuccessful, removal of tonsils and adenoids will usually be followed by the disappearance of the bacilli.

INDUSTRIAL LEAD POISONING*

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Lead poisoning is almost as old as written history. Ancient Rome used lead pipe in its wonderful waterworks system, and many of the inhabitants became afflicted with the disease. It has received the attention of physicians ever since the dawn of medical science, and every age has witnessed contributions on the subject by medical men. The more recent additions to our knowledge of the problem have been made through the researches and writings of such authorities as Oliver, Legge, Goadby, Hamilton and Hayhurst. Notwithstanding all these contributions, there still remain a few points about which there is some disagreement, and the present paper, not intended as a thorough discussion of all the phases of plumbism, is offered for what it is worth as an aid in clearing up a few of these points. The material is drawn from experience gained during a study of lead poisoning in several industries, during which I made thorough physical examinations, including laboratory work, of more than 900 workers exposed to the lead hazard. Eighty of these were found to be suffering from lead poisoning in various degrees of severity, and ninety-five others had sufficient signs and symptoms of plumbism to warrant a tentative diagnosis.

ETIOLOGY

By far the greatest amount of lead poisoning occurs among industrial workers. There are now approximately 200 American industries in which lead in some form is used, and in which there is consequently a possibility of the workers' contracting plumbism. As industry is becoming more and more diversified, this number is constantly being increased.

With the possible exception of the silicates, it seems that lead in any form is capable of producing poisoning. This danger is more apparent with the soluble salts and with the fumes from the molten metal. It decreases as the salts become less soluble, and as the temperature of molten metal is decreased. Thus, with lead sulphid, a salt relatively insoluble in the gastric and intestinal juices, and with the cold metal itself, there is comparatively little danger.

Aside from the industrial sources, lead poisoning occasionally occurs in domestic life. Formerly this type was fairly frequent, owing to the lead absorbed from lead pipes by drinking water. Cases have also occurred from eating canned food, because of the dissolving action of certain fruit juices, etc., on the lead in the solder. Other cases have occurred through the use of cosmetics, hair dyes, etc., containing lead.

The "portals of entry" by means of which lead enters the body are threefold. The most important of these is through the digestive tract, as when lunches are kept or eaten in rooms in which there is dust containing lead; when food or tobacco is handled with hands dirty with lead compounds; when water or food containing lead is used; and when men working in atmospheres contaminated with lead dust swallow either the dust which accumulates in their nasopharynx or what is dissolved in their saliva.

The second channel of entrance is by way of the respiratory tract through breathing of lead fumes and dust containing lead. Lead poisoning may occur from the fumes of molten lead even when the temperature of the latter does not reach the boiling point. I have demonstrated by means of sodium sulphid papers that lead fumes are given off from pots of molten lead at a temperature of approximately 750 F., and have found cases of lead poisoning among the men working with lead at this temperature. It is quite likely that fumes are given off at temperatures even lower than this. Most of the lead dust breathed is caught in the nasopharynx and swallowed. Lehman and Saito have shown experimentally that when dust is breathed only 12 per cent. reaches the lungs, whereas 70 per cent. reaches the alimentary canal.

The third and least important channel of entrance is through the skin. Some investigators have denied that lead poisoning can be caused in this way, but enough cases have been encountered with apparently no other possible means of absorption to entitle it to consideration. As mentioned in a previous paragraph, cosmetics and hair dyes containing lead have been known to cause plumbism. A case was encountered in Cleveland which had apparently developed from the use of a cane with a lead head. This case is similar to that of the harness-maker reported in the literature who developed lead poisoning from the use of a small piece of metallic lead with which he was in the habit of pounding the leather. I myself encountered two mild cases among men who handled 100-pound lead pigs. In this case there is, of course, the possibility that they breathed and later ingested tiny bits of metallic lead dust or lead oxid worn off the pigs in handling.

The lead that reaches the stomach is converted into the chlorid by the action of the gastric juice. In this form it is capable of osmosis and so enters the blood stream, where it combines with proteins, forming an albuminate. The lead that reaches the lungs passes through the alveolar and capillary walls and forms the same compound. If lead is really absorbed through the skin, it is likely that this compound is formed there also.

Some of the lead albuminate is excreted by the kidneys; the remainder passes into the tissues, where it remains insoluble so long as the reaction is neutral. It may remain here for long periods, doing no harm until some change occurs in metabolism to alter the reaction of the tissues. This renders the albuminate soluble and capable of reabsorption. It is thus able to reenter the blood stream and once more exert its harmful effects. For this reason it is sometimes unwise to give iodids to patients who have worked in lead, as the iodids may release the albuminate and cause the lead to be reabsorbed, with resulting manifestations of acute plumbism. Any sudden unusual exposure, a drinking bout, or an infection such as influenza, may produce the same effects.

Lead that is not acted on by the gastric juice passes out in the feces as a sulphid. The gastric juice is capable of exerting more solvent action on lead when

* This paper was awarded the $100 Hamilton Fisk Biggar, Sr., prize for 1920, granted by the Cleveland Medical Library Association.

the stomach is empty; therefore workers exposed to the lead hazard should always eat breakfast before going to work; and light lunches, e. g., a glass of milk, at intervals during the working day are desirable.

The susceptibility to plumbism varies enormously. Some workers will develop an acute attack after working only a few days, while others may work for months at the same employment without experiencing deleterious effects. I found workers who had been exposed for more than forty years without experiencing any ill effects, and I found others who had been at the same work only a few weeks and had taken just as many precautions, who developed plumbism.

PATHOLOGY AND SYMPTOMATOLOGY

Acute Form.—The usual case begins with some digestive disturbance—a sweetish metallic taste in the mouth, nausea, sometimes vomiting, anorexia, and frequently diarrhea. The latter is due to the gastroenteritis that is so often present. Constipation and colic also occur in a large number of cases. The colic is very severe, wholly incapacitating the patient. There is usually marked pallor of the skin, due to constriction of the peripheral vessels rather than to any actual anemia. These symptoms are commonly accompanied by frequent severe headaches, insomnia, general asthenia, and a feeling of lassitude. Often an acute interstitial neuritis occurs, causing a distal ataxia and severe pains along the nerves affected. The optic nerve may be attacked, later causing optic atrophy and blindness. There is usually some albuminuria due to an acute nephritis affecting the cells of the renal tubules.

It is in the acute form that the encephalopathies most often occur. These cases are comparatively rare, however, and are caused by cerebral edema and minute cerebral hemorrhages. Symptoms are severe headaches, delirium, convulsions, vomiting, retinal changes with diplopia or transient blindness, and sometimes paralysis, coma and death.

In acute cases the red blood cells become more resistant to hemolysis than normally. Therefore in these cases Liebermann's blood corpuscle resistance test is of diagnostic value. In chronic cases this test is worthless. At this stage, basophilic degeneration of the red cells may also be detected.

Acute cases sometimes occur within a few days after exposure has begun. In these the lead line is absent. In those cases, however, which suddenly attack an individual who has been exposed for years, there is usually a lead line, indicating that the individual has been absorbing lead for some time. Such attacks are due to a sudden change in metabolism whereby the individual's excretion can no longer keep pace with his absorption. Such cases sometimes develop a sudden paralysis almost without any previous symptoms.

I will cite a few representative case histories which illustrate some of the forms of acute plumbism:

Case 1.—A man, aged 24, works manager in a pottery, during the absence of a sagger-washer painted saggers with a solution of red lead. There developed severe diarrhea accompanied with anorexia, nausea, headache, dull abdominal pain, albuminuria and a general feeling of lassitude. Symptoms soon cleared up on cessation of the work and began again several days after its resumption. A diagnosis of mild acute plumbism was made.

This case is listed merely as an instance of a case in which there was diarrhea. Some physicians assert that the intestinal spasm which so frequently occurs causes constipation, and deny that diarrhea can occur. This is a false assertion, for diarrhea often occurs in patients having a gastro-enterocolitis, and constipation and diarrhea sometimes alternate. This case is also an instance of a person's being peculiarly susceptible to the effects of lead intoxication.

Case 2.—A man, aged 57, who had been a dipper in a pottery twenty-six years, stopped pottery work four and one-half years ago and farmed for three years. At the end of this period he began dipping again. He dipped two weeks, when a peroneal paralysis of the right leg occurred with toe drop. There was considerable pain in the foot and ankle and along the course of the peroneal nerves. He had a metallic taste, nausea, and tremor of the tongue. There were no other symptoms. He discontinued work four months, during which time he gradually regained strength in the peroneal muscles and power of dorsiflexion of his toes. The neuritic pains gradually left.

This case illustrates the acute form with paralysis which sometimes occurs almost without symptoms in cases previously exposed to lead. Acute plumbism, however, is usually diagnosed by symptoms rather than by the physical signs:

Case 3.—A man, aged 22, was a glost-kiln placer in a pottery for three years. He was then in the army six months, after which he returned to the pottery and has now been working six months. He is losing weight, has general malaise, asthenia and a feeling of lassitude, frequent severe headaches, nausea, breakfast anorexia, a metallic taste, constipation, lumbago, muscular cramps in the legs and arms, dull muscular aches, and frequent attacks of dizziness. He has pallor and tremor of the fingers. Examination otherwise is negative. The diagnosis is mild acute lead poisoning.

Case 4.—A man, aged 42, who was a glost-kiln placer six years, rather suddenly developed marked pallor, asthenia, tremor of the fingers and hyperactive reflexes three years ago. He had had a lead line for some time. One day shortly thereafter he suddenly lost consciousness and was unconscious for about one hour. This was followed by severe headache, ptosis of the right upper eyelid and diplopia. He did not work for six months, and gradually recovered. He still has a lead line, and tremor of the tongue. The hemoglobin is 88 per cent. Dorsiflexion is impaired on the right. The Wassermann test and venereal history are negative. This man is an instance of acute encephalopathy superimposed on a case of lead absorption. He recovered from the acute attack, but still has lead absorption, as evidenced by the lead line. Should his present balance between absorption and excretion be again disturbed, he would probably have another acute attack.

Case 5.—A man, aged 47, a dipper for thirty years, three months ago after a drinking bout began to feel dizzy and light headed. These symptoms rapidly became more severe, and diplopia developed. Soon he began to notice numbness of his whole left side, and he became very weak. At this time he had breakfast anorexia, great drowsiness, tinnitus aurium, extreme nervousness, tremor of the tongue and fingers, marked pallor, cyanotic gums, lead line, weak grip, impaired dorsiflexion, and albuminuria. Suddenly he developed severe abdominal cramps, which lasted off and on for several days, during which his temperature was 97; pulse, 56; systolic blood pressure, 160; diastolic, 90. The hemoglobin was 90 per cent. After a two months' rest, his symptoms have gradually disappeared, though he is still very weak and has a marked lead line. The pulse is now 80, temperature normal, and blood pressure 140 and 85. This case is another instance of disturbed balance and resulting lead intoxication after a number of years' exposure. He, too, had had lead absorption for some time, as was shown by his lead line, but had experienced no ill effects therefrom.

Chronic Form.—Marked pallor is almost a constant symptom. According to many investigators, this is due to an actual anemia. I am inclined to believe that

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anemia occurs less frequently than is commonly supposed; for although most of the patients in my series exhibited the pallor, red blood counts in nearly all cases were but slightly below normal. As stated in a previous paragraph, I believe this pallor to be due to a vasomotor constriction, a spasm of the peripheral arterioles, perhaps of a nature similar to the spasm of the intestines which so often occurs, and perhaps also similar to the muscular spasms which cause the painful muscular cramps, a rather common symptom. The hemoglobin percentages vary considerably, but on the whole are not much lower than those found among any similar group of working people not affected with plumbism. None were found below 65 per cent; the majority were between 80 and 100. This tends to bear out the hypothesis that the pallor is caused by constriction of the peripheral vessels rather than by a secondary anemia.

In connection with this it may be well to discuss briefly the other blood changes. A number of investigators have reported the finding of basophilic degeneration of the red cells in chronic cases. In my series I found it in only one instance—an early case—and the stippling was not marked even in this case. It is my conviction that basophilic degeneration has been greatly overrated as a diagnostic sign. If present frequently enough to be of diagnostic value, it must be in the early stages.

In all cases of chronic plumbism, however, I did find one change in the blood picture which was practically constant. This was a marked increase in the large mononuclear cells, ranging from 10 to 35 per cent. This increase was frequently at the expense of the polymorphonuclear cells, and sometimes at the expense of the lymphocytes. Hayhurst is the only other investigator that I can discover who has made note of a similar finding. It was so constant in my cases that I believe it is a point possessed of some diagnostic value, provided, of course, that other causes of such a mononucleosis can be ruled out. Such conditions, however, are not likely to be confused with plumbism.

Although there is usually some anisocytosis and poikilocytosis, I did not find them present to the extent usually spoken of; nor did I find the presence of nucleated red cells much above the average. These facts coincide very nicely with the absence of marked anemia.

Nearly all chronic cases exhibit some one or all of these digestive disturbances: metallic taste, anorexia, nausea, abdominal pain and tenderness, constipation and colic. The constipation is often of an extremely obstinate type, and is much more common in the chronic cases than is diarrhea. The latter may be alternated with it, however. The true lead colic causes very severe pain, morphin sometimes proving inadequate in giving relief. The colic usually follows constipation. The anorexia is probably responsible for much of the loss of weight which often occurs.

General malaise and asthenia are early symptoms. These are often accompanied by insomnia, dizzy spells, lethargy, etc.

In an individual who works with his hands a great deal, paresthesias in the hands and fingers, weakness of the grip and weakened power of dorsiflexion of the wrist may be the first warnings of chronic plumbism. These are due to a beginning interstitial neuritis, which affects usually the nerves supplying the muscle groups which are most used. This is probably the most important pathologic change in chronic lead poisoning, and, if it continues, results first in neuritis along the course of the nerve affected and later in wrist drop, toe drop, shoulder drop or head drop, as the case may be. After a time the muscles affected may undergo atrophy and fatty degeneration, and the opposing set of muscles may contract. This sometimes occurs in cases of wrist drop, and a partial subluxation of the wrist results. In long-standing cases of such paralysis, tender tumors, somewhat resembling a ganglion, may occur. These various paralyses occasionally occur very suddenly—almost without warning—in individuals who have been exposed for some time. In rare cases there are generalized palsies, which may involve the diaphragm and cause death.

Headache is the most common symptom presented by the nervous system. This is sometimes constant and is frequently very severe. The other nervous symptoms mentioned above under acute forms sometimes occur, but not with such frequency. There may be periods of profound mental depression apparently without cause, which may alternate with periods of excitability.

Marked tremor of the fingers, tongue, lips and eyelids are nearly always present, and constitute a prominent sign. These may be accompanied by muscular incoordination and possibly fibrillation. There is usually distal ataxia due to the peripheral neuritis. In the early cases the reflexes are usually hyperactive; later they are diminished. The pupils may be springy and irregular. Chronic muscular rheumatism, lumbago, and pains in the ankles, feet and knees are frequent complaints.

Contrary to the reports of many investigators, I found the lead line to be one of the most constant signs. This may be due in some measure to the form of the lead to which the patients were exposed. At any rate, more than 90 per cent. of all my patients had well marked lead lines. These were very readily demonstrated by lifting the margin of the gum away from the tooth with a thin, white toothpick. The black deposit of lead sulphid in the end arteries of the gums then appeared very prominent against the white wood as a background. Most of the patients in my series also had very bad gums and teeth—whether as a cause or a result of the lead line, I do not know. I am inclined to believe the former, however, for it is certainly true that there is more pyorrhea and carious teeth among workers exposed to lead than among similar groups of workers not so exposed. I also found a number of patients with lead lines who still had very good teeth and gums. It may be that the deposit of lead sulphid in the end arteries of the gum margin impairs the circulation there, resulting in decreased nutrition and vitality. This in turn would cause lack of tone and decreased resistance, and would readily permit decaying food particles and mouth organisms to find their way in between the tooth and the gum, thus facilitating the rapid development of pyorrhea.

While a lead line is positive evidence of lead absorption, it does not mean necessarily that the individual has lead poisoning. I saw many patients with well marked lead lines who were apparently well. These are all potential cases of plumbism, however, and if something should happen to disturb the balance between absorption and excretion, which thus far they have been able to maintain, they would probably develop acute plumbism. The same thing is true of lead in the urine and feces.

"Oliver's sign," a black discoloration of the buccal mucosa opposite a carious tooth, is often present. I

do not believe that much importance can be attached to this sign, however, for the discoloration is often present in the mouths of people not exposed to lead. For example, such discolorations occur normally in the buccal mucosa of negroes.

Among women, irregularities of menstruation are a common result of plumbism. These may appear as dysmenorrhea, menorrhagia or amenorrhea. It also seems to be an established fact that women exposed to the lead hazard are more subject than others to abortions.

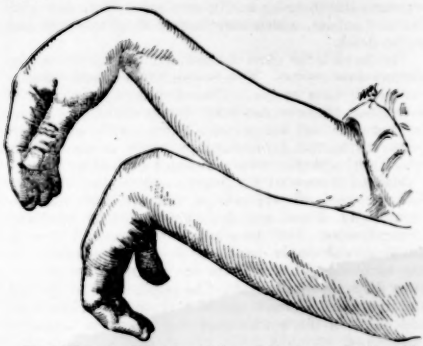

Fig. 1 (Case 6).—Bilateral wrist drop: from photograph taken while patient was trying to extend his hands.

In long standing cases of plumbism a fibrotic change occurs in the blood vessels and in many of the organs. Hypertension, except where there is lead colic, is not so common, however, as would be supposed. In this my results also differ from those of some other investigators, for I did not find it at all frequently, except in one group, in which the patients were working in a lead refinery. In many of these there was hypertension; but among pottery workers, who labor just as hard, there was practically none (eight patients with bilateral wrist drop had practically none). It may be that here too the form of the lead to which the worker is exposed is more or less of a determining factor. In many cases the liver becomes fibrotic, the kidneys contracted, heart valves sclerosed, and the vocal cords thickened. The latter often results in a tremulous voice, which is rather marked in old cases of plumbism.

At death, lead may be found in the liver, kidneys, spleen, brain and muscles.

The following case records are given as a means of illustrating some of the types of chronic lead poisoning:

Case 6.—A man, aged 37, a dipper in a pottery fifteen years, has been a heavy drinker for years. Although he had some pallor, he felt perfectly well until six months ago, when he began to notice weakness in his thumbs. This became progressively worse, until his whole hands and wrists were affected. Two months ago he was lifting a ware board when his wrists suddenly "gave way," and he has had complete bilateral wrist drop ever since (Figs. 1 and 2). He has had absolutely no symptoms of plumbism except paresthesias in his hands. Examination reveals, besides double wrist drop with antebrachial and some scapulohumeral muscular atrophy, marked pallor, edema of the hands and fingers, marked tremor of the fingers, lips, eyelids and tongue, muscular fibrillation, springy pupils, absence of all teeth, mitral insufficiency, edema of feet, and distal ataxia. The blood pressure is normal. The reflexes are decreased. The hemoglobin is 95 per cent. The red blood count is 5,200,000. There is no basophilic stippling. Large mononuclears, 24 per cent. of white cells. The blood pressure is: systolic, 135; diastolic, 85.

This case is noteworthy because of the sudden incidence of the paralysis without premonitory symptoms, except for weakness of the thumbs (which are used most in dipping), in a man who had been exposed to lead for years; and for the absence of any gastrointestinal disturbances—even constipation. Here is direct proof to controvert the popular idea that lead poisoning cannot occur without constipation. This fact is also illustrated by Case 7.

Case 7.—A man, aged 55, a dipper in a pottery for twenty years and a heavy drinker for thirty years, three and a half years ago began to experience numbness and tingling in his right hand and forearm. This steadily increased, and soon his left hand and forearm were also affected. This paresthesia was accompanied with edema of the wrists and fingers, and was alternated with muscular cramps. Soon his wrists and fingers became weak, and he lost his dexterity, being almost unable to button his clothes and to accomplish the finer movements. His arms became stiff at times, and he suffered from neuritic pains. After about six months of this, he became so weak that he was scarcely able to work. Fearing wrist drop, he ceased pottery work and took up the insurance business, which he continued for six or eight months. During this period he became considerably stronger and so again took up pottery work. His weakness soon began to recur, and in about one year he had double wrist drop. While this was developing, he had begun to have general malaise, asthenia, anorexia, nausea, vomiting, metallic taste, fits of depression without apparent cause, insomnia, and pains in the arms, legs and neck. After the wrist drop occurred, he began medical treatment, which he continued for about a year, his wrists gradually becoming stronger. He then began dipping again. He dipped for nineteen days, when the double wrist drop recurred, and he began to have difficulties in locomotion and severe pain in his legs, together with a recurrence of his former symptoms. Examination revealed almost no pallor, poor teeth, good gums, with marked lead line, mitral insufficiency, antebrachial paralysis with some atrophy, and tremor of the tongue and fingers. He was not constipated at any time. The hemoglobin was 90 per cent.; red blood count, 5,180,000; no basophilic degeneration; large mononuclears, 18 per cent. of white cells; blood pressure: systolic, 140; diastolic, 90.

Fig. 2 (Case 6).—Manner in which it is necessary for the patient to support his arm and turn his wrist in order to grip any object.

The tendency for the paralysis to disappear when exposure to lead ceases is well marked in this case.

Case 8.—A man, aged 45, a dipper in a pottery for eighteen years, a "moderate" drinker, complains of general asthenia, frequent severe headaches, malaise, morning nausea, pronounced anorexia, metallic taste, abdominal pain and tenderness but no true colic, very bad constant constipation, neuritic pains in the arms, hands and shoulders, sore muscles, painful joints, lumbago, parethesias, alternating periods of depression and excitability, failing sight, insomnia, dizziness and lethargy. He has been losing weight for the last six months. He is poorly nourished, and has an unhealthy appearance; local emaciation of the hands, wrists and forearms; pallor of the face, lips and conjunctivae; arcus senilis; springy pupils; cyanotic gums; fair teeth but much worn; marked

lead line; coated tongue; tremor of the tongue, fingers and labial muscles; tremulous voice; muscular weakness; impaired dorsiflexion of the wrists, especially on the right; grip, 60/70 (normally 120/110 for men, 65/55 for women); enlarged joints, and hyperactive reflexes. The systolic blood pressure is 140; diastolic, 80; hemoglobin, 65 per cent.; red blood count, 4,600,000; central pale area, increased; large mononuclears, 16 per cent. of white cells; no basophilic degeneration of reds.

This is a fairly typical case of chronic plumbism, with the exception of the fact that the hemoglobin percentage is lower than usual.

CASE 9.—A man, aged 31, a glost-kiln placer, notices that his arms feel unduly weak and tired; there is increasing numbness in the hands. He has dizzy spells several times a week, constant metallic taste, and headaches; about once a week he has attacks of nausea with colicky pains around the umbilicus, which last several hours, not severe enough for typical lead colic; he has rheumatism in the shoulder. He has pallor of the skin and conjunctivae, pink, healthy gums with marked lead line, good teeth, and tremor of the tongue. His grip is 70/75. Dorsiflexion is impaired. The systolic blood pressure is 135; diastolic, 80; hemoglobin, 92 per cent.; red blood count, 5,100,000; large mononuclears, 13 per cent. Some basophilic degeneration of the red cells, not marked, is detected.

This case illustrates early chronic lead poisoning. Cases 8 and 9 are examples of loss of strength in the hands and weakened dorsiflexion of the wrist. This is more marked in the hand that is most used.

CASE 10.—A man, aged 41, a dipper, has had repeated attacks of lead colic during the last five years. He has frequent headaches, malaise, asthenia, morning nausea, metallic taste, abdominal pain and tenderness, "muscular rheumatism," paresthesias, tinnitus, aurium, itching eyelids, and dizzy spells. His expression is drawn; the pupils are unequal, with sluggish reaction; he has pyorrhea, a lead line, and fair teeth; twelve teeth are out; there are coated tongue; hyperactive reflexes; atrophic nails, and tremor of the tongue, lips and fingers; the hands are edematous; sight and hearing are impaired. The blood pressure is: systolic, 135; diastolic, 78; hemoglobin, 84 per cent.; red count, 4,800,000; no basophilic degeneration; large mononuclears, 17 per cent.; small mononuclears, 35 per cent. of white count.

CASE 11.—A woman, aged 46, a dipper's helper, has anorexia, metallic taste, constant headaches, abdominal pain and tenderness, frequent attacks of colic, constant constipation, paresthesias and neuritis in arms, muscular soreness, pains in the joints, dysmenorrhea, menorrhagia, and fits of depression without apparent cause. She has had one abortion; there are no living children. She has an unhealthy appearance, lead line, spongy gums and poor teeth. The grip is 58/39. The systolic blood pressure is 138; diastolic, 86; hemoglobin, 80 per cent.; red blood count, 4,200,000; large mononuclears, 18 per cent.

These various cases represent some of the common types of chronic plumbism. They demonstrate the general absence of basophilic degeneration of the red cells and the absence of marked anemia and hypertonus. These are signs to which I believe undue prominence has been given. The mononucleosis which so frequently occurs is well illustrated in these cases. Edema of the hands is rather frequent, and is usually associated with paralysis or a warning of its approach.

DIAGNOSIS

In order to accomplish the best results in treatment, the diagnosis of plumbism, like that of tuberculosis, should be made early. If we wish to prevent the more severe effects of lead poisoning—encephalopathies, lead colic, wrist drop, optic atrophy, perhaps generalized paralysis, and the various degenerative diseases so frequently associated with it, e. g., nephritis and arteriosclerosis, we must diagnose the disease and begin treatment in its incipience. The mistake is frequently made of refusing to diagnose a case as lead poisoning unless there is a lead line or colic or wrist drop. As a rule, however, these are fairly late symptoms. The fallacy of expecting constipation in all cases of plumbism has already been pointed out.

One of the greatest aids in diagnosis is a history of exposure. Without this knowledge, lead poisoning will frequently be overlooked. With this knowledge, plumbism should be at least considered in all obscure complaints arising among the workers. Pallor of the skin, muscular weakness, headaches, general asthenia and malaise, paresthesias, anorexia especially for breakfast, constipation or perhaps diarrhea, rheumatism, muscular soreness, abdominal pains and tenderness, colic and nervousness are all symptoms which should be carefully weighed in any worker exposed to lead before a diagnosis of lead poisoning is ruled out.

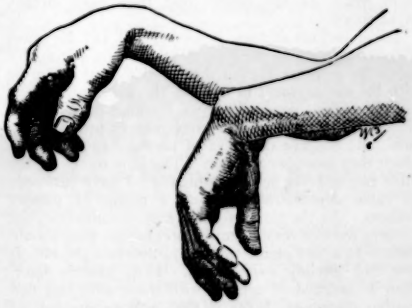

Fig. 3.—Wrist drop in another patient.

The lead line is of considerable value as a diagnostic point in all chronic cases, and often in acute cases which occur in people who have been exposed to lead for some time. Although a lead line does not necessarily mean lead intoxication, yet it is absolute evidence of lead absorption, and as such should at least be considered as indicating potential lead poison. The same significance can be attached to the finding of lead in the urine or feces.

Lead colic may sometimes be confused with appendicitis, intestinal obstruction, gallstones, etc. In the case of lead colic, however, the temperature is rarely increased, the pulse is slow and hard, and the blood pressure usually increased. Furthermore, there is little if any leukocytosis, and the protective rigidity of the abdominal muscles is usually absent.

In acute cases, basophilic stippling and increased resistance to hemolysis of the red cells may be of diagnostic value. In chronic cases these are usually absent, but in their stead there is commonly a mononucleosis of from 10 to 35 per cent., which may aid in the diagnosis.

PROPHYLACTIC TREATMENT

By means of proper prophylactic measures, lead poisoning in American industries could be greatly reduced, if not wholly prevented. Proper prophylaxis necessitates close cooperation between employers and employees. The employer must provide suitable work-

ing conditions. This means the removal of dust and fumes, and the provision of clean working rooms, adequate ventilation, lunch rooms, drinking and washing facilities, locker rooms and capable medical supervision. Frequent periodic examination of all workers exposed to lead is a necessity, and workers should report immediately any symptoms suggestive of plumbism. Rules prohibiting eating in rooms in which there is lead must be rigidly enforced. The education of the workers along the lines of personal hygiene and the prevention of disease should be the aim of all industries. Industry should consider the victims of lead poisoning in a more sympathetic light. In many plants, if the foreman thinks a man is developing plumbism, he either discharges him or permits him to continue at the same work until absolutely incapacitated. Since neither of these policies is constructive, both should be condemned. Instead, an effort should be made to give such men different work which will not expose them to the lead hazard and which will permit them to recover from many of the effects that they have already experienced.

These various factors, however, will fall far short of accomplishing all the good of which they are capable unless the workers do their share. They must cooperate with the management in keeping the workrooms clean and the various personal service facilities in good condition. They must use the conveniences provided for them, and observe the rules of personal hygiene, etc., which they have been taught. The importance of the latter can scarcely be overestimated. I have just seen its value demonstrated among a group of pottery workers. At the time of their first examination, the workers were advised as to the precautions they should observe to avoid plumbism and to decrease the effects they had already experienced. Four months later, when I returned to consult with those who had had positive diagnoses, I found that a large number of these had been following the advice given them four months before and, as a result of the simple measures of personal hygiene employed, had greatly improved. The symptoms of practically all had decreased in severity, and a number had gained from 10 to 20 pounds in weight even in this brief time. By the observance of the rules of hygiene and common sense, they had been able to stop or at least minimize the absorption of lead, and as a result their bodies were better able to cope with that which they had already absorbed.

A few of the men whom we had diagnosed had not seen fit to follow our advice, and practically all of these showed progression and were worse than when first seen.

Many of the men habitually take magnesium sulphate several times a week as a preventive. This is undoubtedly of some value, for it keeps the bowels open and tends to precipitate the lead in the intestinal tract and cause it to be excreted in the feces. A number of the men take a course of sulphur baths several times a year, and report a feeling of increased well-being and vigor afterward. Their actual value is problematic, as is also the prophylactic use of the Oliver-Clague electrolytic treatment.

In some factories in which lead is used, it is the custom to give the men 1 grain calcium sulphid tablets daily. This forms the more or less insoluble lead sulphid, which passes out in the feces. It is reported that the incidence of plumbism is less in these plants than in those in which this drug is not used.

CURATIVE TREATMENT

In curative treatment, the first thing is to remove the patient from the source of the poisoning. After this, potassium iodid in from 5 to 10 grain doses, three times a day, is usually given, the theory being that it liberates the lead which has been deposited as an albuminate in the tissues, and thereby permits it to be excreted through the kidneys. The liberated lead is in a soluble form, and in some cases is likely to be reabsorbed with an exacerbation of symptoms. It is therefore wise to begin the treatment with small doses, and in acute cases to withhold it altogether.

For the constipation, magnesium sulphate is probably best, since this aids in the prevention of absorption of lead by the intestines through the formation of a relatively insoluble compound, which passes out in the feces. In some cases the constipation is so obstinate that salts, castor oil, etc., all fail, and it becomes necessary to administer croton oil; 1 drop on a piece of sugar is usually sufficient. A mixture of potassium iodid, magnesium sulphate and a bitter is sometimes resorted to for the colic and constipation.

The researches of Macht [1] and his co-workers and of Litzenberg [2] on the action and uses of benzyl benzoate, an opium alkaloid of the benzyl-isoquinolin group, have shown that this drug counteracts remarkably well the spasm of smooth muscle. They have also shown that ureteral colic, excessive intestinal peristalsis and spastic constipation yield to the tonus-lowering antispasmodic effect of the drug. Its very low toxicity, combined with its peculiar pharmacologic action, suggests that it may readily become the sovereign remedy for the constipation and colic of lead poisoning. It may be prescribed in this mixture:

		Gm.
℞	Benzyl benzoate	10
	Mucilage of acacia	5
	Aromatic elixir of eriodictyon	35

Give from ½ to 2 drams about every two hours, according to necessity.

For the colic, hot applications are of value also, together with the administration of morphin or morphin and atropin, when necessary.

In cases of convulsions, the bowel should be washed out with warm water containing a little mustard. This is followed by an enema containing chloral or one of the bromids.

For the paralysis, massage and the galvanic current are of the greatest value. In case of wrist drop, the hand should be placed on a splint to prevent contraction of the opposing groups of muscles. Strychnin sulphate or nux vomica is often used empirically as an adjuvant to this treatment.

The Clague-Oliver electrolytic treatment has been much advocated in some quarters as having both prophylactic and curative value. Its sponsors claim that it abstracts lead from the body through electrolysis. The experiments of Goadby and others have proved this assumption to be wrong. I have had a good opportunity to observe the effects of this treatment, and while I think that its value has been greatly overrated, yet I believe that its use is nevertheless productive of some slight benefit. This value lies, not in the withdrawal of lead from the body, but in certain symptomatic effects. Most of the men who have tried the method say that after treatments they eat better, sleep

1. Macht, D. I.: A Therapeutic Study, Pharmacologic and Clinical, of Benzyl Benzoate, J. A. M. A. **73**: 599 (Aug. 23) 1919.
2. Litzenberg, J. C.: The Use of Benzyl Benzoate in Dysmenorrhea, J. A. M. A. **73**: 601 (Aug. 23) 1919.

better, and feel better, their wrists are stronger, and they make slight gains in weight. The gains in weight credited to the treatment are due, I believe, to the better eating and sleeping. The improvement in symptoms noted above may be due to the tonic effect of the current or to the psychologic effect of the treatment. In any case, even such a symptomatic improvement as noted is of some value, and would be of assistance as an adjuvant to the other methods of treatment already outlined.

As an aid to both the prophylactic and the curative treatment of industrial plumbism, laws providing for compensation for occupational diseases are becoming more and more necessary. The injustice of allowing compensation for accidents, which may disable a man for a few weeks, and at the same time refusing to allow it for lead poisoning, which may cause disability for life, is beginning to be recognized. Compensation for occupational diseases is now allowed in several states and territories, and the indications are that it will soon be granted in others. Under such a system the loss of wages due to cessation of work for a time in order to recuperate from the effects of lead would not cause such a large economic loss as at present, and a man with, say, approaching wrist drop could stop work before becoming wholly incapacitated, with the knowledge that he would be cared for during his illness. This would cause a great reduction in the number of permanent disabilities due to lead and in the number of cases of severe plumbism.

The incidence of lead poisoning in American industry is far greater than is commonly supposed. This is because the majority of the cases are not reported, even though many state laws require the reporting of all occupational diseases. Some of the cases are not reported because there is no attending physician. This is sometimes true in even severe cases with wrist drop. Others are not reported because of the fear of giving the factory a "black eye" in the estimation of the state department of health, or because of the patient's fear of discrimination by insurance companies, etc.

It is a function of most state departments of health to study the cause, prevention and cure of occupational diseases. Progress cannot be made in such work unless there is complete knowledge of the incidence of the various diseases due to occupation. Such knowledge can be gained only through the prompt and thorough reporting of all cases. This means that every physician should cooperate with the state department, at least to the extent of reporting all cases with which he comes in contact.

PROGNOSIS

In mild cases the prognosis is good. In the encephalopathies the outlook is worse, for in such cases permanent mental symptoms may follow. Some severe acute cases are fatal.

Patients with wrist drop usually recover. I have known patients to have wrist drop six or seven times and recover. Wrist drop or other paralyses associated with the muscular atrophy, however, usually persist to a greater or less degree. Among habitual users of alcohol the outlook is worse than for abstainers.

Lead poisoning, as a rule, is a disabling rather than a fatal disease. The records of its effects must be sought in the morbidity records rather than in the mortality records. Aside from its own immediate effects, it is a cause of such degenerative diseases as cirrhosis of the liver, valvular heart lesions, nephritis and arteriosclerosis, and in this way often cuts short the normal span of years. In lead poisoning centers, the true end-results of cases of plumbism are to be found in the mortality records under such headings as "died of a complication of diseases." A number of patients, however, live to a ripe old age. I know one man, now over 70, with double wrist drop and muscular atrophy, which he has had for twenty years. During this time he has been practically disabled and dependent on his friends for support.

In connection with prognosis, some observations are pertinent which I recently made on the continued exposure to lead after a diagnosis of plumbism had been made. In 1913 and 1914, the Ohio State Board of Health undertook an extensive survey, under the direction of Dr. E. R. Hayhurst, of the effects of the various occupations on the health of the workers engaged therein. During this survey a number of cases of lead poisoning were encountered. Five years later, through the courtesy of Dr. Albaugh, director of the division of industrial hygiene, I had an opportunity to compare the present condition of a number of my patients with their condition in 1914, as shown by the 1914 case histories and records. I also looked up a number of the 1914 patients who are no longer exposed to lead, in order to note the effect of removal from the source of the poisoning on the health of the individual. The following conclusions, drawn from this follow-up work, were made after a study of more than 100 such cases:

1. Cases of lead poisoning in which the patients continue to be exposed to the lead hazard under the same conditions steadily progress.

2. Patients with lead poisoning who continue to be exposed to the lead hazard under the same conditions but who lessen or abolish the absorption of lead through the observance of proper hygiene, etc., usually tend to improve. Many such patients recover.

3. Patients with lead poisoning who continue to be potentially exposed to the lead hazard, but whose absorption of lead has been decreased or abolished through improvement in working conditions and personal service facilities, usually tend to improve. Many such patients recover.

4. Patients with lead poisoning who remove themselves entirely from the source of the poisoning usually recover. Except in the more severe cases noted in the first part of this article, the recovery is usually complete.

These conclusions may be considered, in a general way, as principles of prognosis. They also serve to emphasize still more the principles of removal of the source of the poisoning as the prime desideratum in both prophylactic and curative treatment.

SUMMARY

Certain signs and symptoms of plumbism have been given somewhat more importance as diagnostic points than they deserve. These are anemia, basophilic degeneration of the red cells, hypertonus and constipation.

Pronounced anemia is present in only relatively few cases; in many severe cases there is no anemia whatever. The pallor that is usually present is therefore due to some other cause—possibly a constriction of the peripheral blood vessels. Basophilic degeneration of the red cells is rare in chronic cases, and its value as a diagnostic point, even in acute cases, has probably been overrated.

The presence of hypertonus is extremely variable. Among a group of pottery workers exposed to lead dust, there was practically none; but among a group of lead refiners exposed to lead fumes, it was present in nearly every case. The cause of this variance is unknown; however, the difference in the form of the lead to which the different groups are exposed may have something to do with it. Hypertonus is nearly always present during attacks of colic.

Although constipation is usual, it is not invariably present. The assumption, therefore, that a patient who is not constipated does not have lead poisoning is fallacious. Many cases of plumbism—especially acute cases—occur without constipation.

A point of diagnostic value which appears to have escaped recognition, except by Hayhurst, is the presence of mononucleosis in chronic cases. This is almost invariably present.

The presence of a lead line is also extremely variable. In my series it was present in about 90 per cent. of the cases. Other investigators have sometimes found it present in not more than 20 per cent. of their cases. This difference, like that in the case of hypertonus, may possibly be due to the difference in the form of the lead in which the patients were exposed.

In the treatment of plumbism, prophylaxis is of much more importance than the curative treatment. By means of proper working conditions and medical supervision on the one hand, and the observance of the rules of personal hygiene and common sense, on the other, together with cooperation between employers and employees, the incidence of plumbism in American industries could be greatly decreased. Proper compensation for occupational diseases is a necessity, and would help to decrease both the incidence and the severity of lead poisoning.

If the cause of the poisoning is removed, the prognosis, except in a few cases, is good even without medical treatment. If, however, the lead continues to exert its deleterious effects through small, steady doses, the case steadily progresses, finally terminating in some form of paralysis or in some of the common degenerative diseases. As a rule, lead poisoning is a disabling rather than a fatal disease, although in chronic cases it undoubtedly hastens death.

Vital statistics of all occupational diseases, including lead poisoning, are very incomplete. Rapid progress by state or federal agencies in the devising of methods for the prevention or cure of all such diseases cannot be made unless there is prompt and complete reporting of all cases.

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Increase in Alcoholism in Germany.—The *Deutsche medizinische Wochenschrift* relates that alcoholism is on the increase again in Germany, saying that eight thousand million marks are spent for alcoholic drinks at present (Es werden z. Z. etwa 8 Milliarden Mark für alkoholische Getränke bei uns verausgabt). At Bremen the number of cases of delirium tremens, which was 176 before the war and nine in 1918, reached sixty in 1920. Cases have been observed at Bremen where young people have spent 300 marks in one night for liquor and been taken to the hospital with serious toxic effects. The editorial adds: "During 1914, 6,000,000 bottles of champagne (sekt) were consumed, but in 1919 the figure was 10,000,000." Bavaria has removed the restrictions on the manufacture of strong beer, and one of the Munich dailies refused to publish an appeal by Kraepelin protesting against removing the restrictions. The *Nederlandsch Tijdschrift* quotes the above figures with the laconic comment, "The world needs mending."

THE DIAGNOSTIC SIGNIFICANCE OF JACKSONIAN EPILEPSY *

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Of all the forms of epilepsy, perhaps none is so interesting and of such diagnostic import as the jacksonian variety. This term is used here to cover hemispasm or monospasm; the spasm, if properly observed, will be seen to have a signal symptom and a regular sequence of events. In the minds of most physicians, jacksonian epilepsy means a definite, focal disease of the motor cortex. Such is not the case in a large percentage of instances; in fact, Collier goes so far as to state that the commonest cause of jacksonian epilepsy is idiopathic epilepsy. Dr. C. K. Mills, in a personal communication, has expressed his concurrence with Collier's belief.

When a patient exhibits jacksonian epilepsy, we must recall, in addition to neoplasm involving the motor cortex, that (1) lesions other than tumor of the motor cortex may produce unilateral spasm; (2) tumors in parts of the brain remote from the motor cortex sometimes are associated with monospasm; (3) toxic conditions may produce jacksonian epilepsy; (4) the myoclonic type of epidemic encephalitis form may produce a picture somewhat similar to the spasm under discussion; (5) the so-called reflex epilepsy may do likewise; (6) hysteria may simulate the condition, and (7) idiopathic epilepsy frequently has an "inside" jacksonian spasm.

JACKSONIAN SPASM DUE TO NEOPLASM OF MOTOR CORTEX

Tumors of the motor cortex are preeminently associated with this dramatic form of epilepsy. The spasm may be limited to the face or the upper or lower extremity. At times in such cases the spasm partakes of the nature of the epilepsia partialis continua first described by a Russian, Koshewnikow, and later by Spiller and by Burr. By epilepsia partialis continua is meant a form in which clonic movements at different sites occur between attacks of major epilepsy; sometimes this type of epilepsy is seen in organic disease of the motor cortex.

CASE 1.—U. F., a negro, aged 26, who came to the nervous dispensary of the Hospital of the University of Pennsylvania, Sept. 20, 1920, and was referred to the nervous ward, complained chiefly of convulsions. He was well until January, 1920. At this time while sitting talking he suddenly felt sick and began to make a grunting noise, while his head jerked rapidly back and forth. His eyes were glassy, he frothed at the mouth, he bit his tongue, and he had an involuntary evacuation of urine. This attack lasted several minutes. He did not fall from his chair and his legs and arms did not move, although he was unconscious during the attack and slept for about an hour afterward. He has had a number of attacks since the first one, but of late they have been less in number and in severity. Three months ago he began to have trouble in speaking. For the last two months he has been drowsy and frequently yawns, and has suffered from severe headache. For the last few weeks he has complained of weakness of the right foot. His previous medical history and family history were negative.

During the examination the patient fell asleep several times and had to be aroused. His station and gait were normal. The pupils were equal and regular, and reacted sluggishly

* Read before the Section on Medicine, College of Physicians, Philadelphia, Jan. 24, 1921.

† From the Neurological Department of the University of Pennsylvania School of Medicine and the Philadelphia General Hospital.

to light but well in accommodation. The ocular movements were well performed; there was no nystagmus or hemianopsia. The examination of the eyegrounds by Dr. Baer revealed a choked disk of 6 diopters on both sides, and a number of retinal hemorrhages. The right side of the patient's face presented frequent rhythmic twitchings. This was usually more pronounced when the patient tried to show his teeth. There was weakness of the lower part of the right side of the face. The grip of the right hand was weaker than that of the left. The patellar reflexes were absent, and plantar stimulation produced a normal response on both sides. The patient understood everything that was said to him. The blood Wassermann test was negative. Oct. 13, 1920, Dr. Charles H. Frazier removed a large tumor from the motor area on the right side involving chiefly the arm center. The tumor on histologic study proved to be a tuberculoma. The patient made a good surgical recovery, but now has renal tuberculosis.

Many instances of jacksonian spasm due to neoplasm of the motor cortex could be recited, but the one reported above will suffice for this etiologic factor.

JACKSONIAN SPASM FROM OTHER CAUSES

Lesions of the motor cortex other than tumor may be associated with hemispasm. These are: (1) subdural hemorrhage; (2) meningo-encephalitis; (3) localized meningitis; (4) depressed fracture; (5) brain abscess; (6) cerebral softening secondary to vascular disease; (7) foreign bodies; (8) multiple sclerosis (Patrick), and (9) angioma. The mode of onset, a history of injury, serologic studies and examination of the cerebrospinal fluid will help to differentiate such conditions from brain tumor.

Neoplasm in parts of the brain remote from the cortex may produce typical jacksonian spasms which differ in no way from those of the motor cortical type; thus, tumors in the cerebellopontile angle occasionally are associated with such a complex. Such cases have been reported by Mills, Weisenburg, Spiller and others. While rare, such a condition is of extreme importance from the standpoint of localization and operation. Case 2 is one of this kind:

CASE 2.—W. S., a man, aged 33, who came to the Hospital of the University of Pennsylvania, Oct. 19, 1915, complained chiefly of blindness and headache. Three years before he had been hit on the right side of the head by a brick which fell three stories. He was unconscious for ten minutes, but then resumed his work and had no after-effects. Two years later he began to have attacks of "drawing" on the left side of the face. The attacks lasted only a few minutes, and occurred once or twice a day. The right eyelids were involved in the attacks, and at times he fell to the ground during a spell. Shortly after the onset of the attacks his eyesight began to fail, and three weeks before admission to the hospital he became totally blind. The man said that his hearing had been poor in the left ear for four years.

There was light perception in both eyes, with a subsiding choked disk and secondary atrophy. There was distinct weakness of the left side of the face, accompanied by nerve deafness on the same side. The corneal reflex was absent on the left side. There was dysmetria in the finger to nose test on the left. Cerebellar catalepsy and adiadokokinesis were absent on both sides. The Bárány tests, like the physical examination, pointed to a lesion in the left cerebellopontile angle. At necropsy a tumor was found in this place.

In this case the jacksonian spasm limited to the left side of the face was due to the irritation of the seventh nerve. A misleading fact in the history was the head injury, one year before the onset of the spasm, although diminution of hearing on the left preceded the accident by one year.

Tumors in parts of the cerebrum other than the motor region, and even of the cerebellum, may cause unilateral spasm. Collier has observed hemiepilepsy in one case of tumor of the pons and in two cases of tumor of the cerebellum, and he attributes the spasm to the hydrocephalus produced by the tumor. Cases of this nature, i. e., hemispasm from the new growth elsewhere than in the motor cortex, should be carefully studied for evidence that will definitely localize the tumor. Neoplasms originating in parts of the brain contiguous to the motor cortex may produce jacksonian attacks by invasion of the motor area. Jacksonian spasm occurring late in the history of cases of brain tumor should be regarded with suspicion, so far as their localizing value is concerned.

Unilateral spasms are sometimes observed in toxic states, namely, diabetes, uremia, acute infectious diseases and alcoholism, without any demonstrable pathologic change in the motor cortex. Oppenheim says that alcohol is especially likely to produce this. A condition of status hemiepilepticus may develop from an accumulation of attacks of the jacksonian type, as a result of toxic causes:

CASE 3.—A number of years ago I was asked to see a patient in one of the medical wards of the Philadelphia General Hospital. The man, who was 48 years of age, had been picked up by the police on the street and was taken to the hospital because of unconsciousness and convulsions. On admission to the ward he was in coma and had jacksonian attacks limited to the right side of the body. The spasms were frequent in number and were separated by short intervals. This condition continued for several hours, and when I examined him there was an exhaustion paralysis of the right side with only occasional twitchings. There was no history obtainable; because of the distinct unilaterality of the convulsions associated with unconsciousness, it was thought that we had to deal with a subdural hemorrhage. It was therefore decided that an operation was indicated; but before the surgeon arrived, death had taken place. At the necropsy the cortex was found normal, and there was no evidence anywhere of injury or disease. Dr. E. A. Leonard, assistant chief resident physician at the hospital, attended the necropsy and recognized the man as one who frequently was a patient in the ward for alcoholics. Dr. Leonard informed me that the man frequently had general convulsions when drunk.

I have recently seen a patient with the myoclonic type of epidemic encephalitis in whose case the question of a focal lesion of the motor cortex arose. The movements were chiefly confined to the right upper extremity; they were rhythmic and occurred about forty-five times to the minute. Because of the mode of onset and of the picture in general, the diagnosis of a localized lesion in the motor cortex was untenable. While the complete microscopic studies of the central nervous system have not as yet been made, it is entirely proper to say that no gross pathologic condition of the motor region was found at necropsy.

Reflex epilepsy may give rise to monospasm. By reflex epilepsy is meant a form of local or general convulsion which is dependent on an old injury of an extremity or of the face. Some writers regard this as a manifestation of hysteria, but Oppenheim is convinced that such is not the case. In this form of spasm there is an aura which arises in the injured part of the body and is felt as paresthesia or twitching. The twitching may remain localized for a long time to the extremity which was injured, but may ultimately become general and be associated with unconsciousness.

Hysteria may be the cause of jacksonian epilepsy. This type of hysteria is not nearly so common as a localized paralysis or as a tremor confined to one upper extremity. I cannot recall having seen a jacksonian

spasm among the numerous psychoneurotics with whom I came in contact in the army. The general make-up of the individual, and a careful evaluation of the signs and symptoms present and absent, should render a diagnostic mistake remote and unlikely.

HEMISPASM IN IDIOPATHIC EPILEPSY

I now come to the part in the discussion of jacksonian epilepsy on which I desire to place particular emphasis. I refer to the attacks of hemispasm which occur in idiopathic epilepsy. Many textbooks make no reference at all to this important condition, and others dismiss it with little consideration. Some neurologists, Collier and Mills in particular, believe that idiopathic epilepsy is the commonest cause of jacksonian epilepsy. Because of the frequency with which unilateral or monospasm is used as a means of localizing real or suspected brain lesions, it will be readily appreciated that many skulls have been and will be opened without an explanation for the attacks being found. Another point of great interest in the discussion of this variety of jacksonian attacks is that a status hemiepilepticus may occur, and it has been found by Leenhardt and Norrero in one family to be an hereditary form of epilepsy.

Cases 4, 5, 6 and 7 illustrate the type of idiopathic epilepsy with an inside jacksonian spasm:

CASE 4.—E. C., a boy, aged 13, had double pneumonia when he was 2 years old, and a month or two later began to have convulsions. He continued to have these attacks rather frequently until he was 5 years old. He was then free of attacks for five years. Since then he has had frequent spells, at least twice a month, and on a few occasions has had status epilepticus. The history as obtained from the father showed that the spasms were distinctly unilateral and on the left side. There was no history of a signal symptom and serial order of phenomena.

The examination of this boy was entirely negative: station, reflexes, sensation, muscular power, eyegrounds, roentgen-ray and blood.

An operation was performed, exposing the right motor cortex, but nothing of a pathologic nature was found.

CASE 5.—A. G., a man, aged 60, has had attacks for the last five years. In these attacks he makes a grunting sound and becomes unconscious. For the last few months he has had spells in which his right hand moves in a clonic manner; some of these attacks are associated with unconsciousness and some are not. There is no weakness of the hand; in fact, his entire examination was negative. An organic lesion of five months' duration should have produced physical signs of some nature.

CASE 6.—K. F., a man, aged 33, has had convulsions since the age of 15. Shortly after the onset of the attacks it was noticed that the convulsions were preceded for some minutes by a tonic spasm of the right foot in eversion shortly followed by twitching of the foot and then by a general convulsion with loss of consciousness, incontinence of urine and the usual signs of a real epileptic attack. Some attacks consisted entirely of a monospasm of the foot. He was trephined over the left motor area, but nothing of a pathologic nature was found. When I saw him about one year ago he was a confirmed epileptic; there were no signs of organic cerebral disease and no evidence of a tumor. The attacks have not changed in their character except that the number of general spasms has been reduced, although the spasms of the foot are more numerous than before.

CASE 7.—H. S., a girl, aged 3 years, had had convulsions for one year, the attacks usually occurring during sleep. The child made a gulping noise, her gaze became fixed, and she fell to the ground if not in bed. The convulsion which followed was always confined to the left side and was followed by sleep. Paralytic phenomena on the left side usually succeeded the convulsions and lasted from twenty minutes to an hour.

The physical examination of this child was entirely negative; there was no evidence of tumor, encephalitis, or injury to the brain. She was sent to the Hospital of the University of Pennsylvania for an operation, however, because of the hemiepilepsy, but this was advised against because the condition was considered to be idiopathic epilepsy.

Many more cases illustrative of the fact that jacksonian spasm is frequently seen in idiopathic epilepsy could be cited, but I think that a sufficient number have been reported to make the point clear.

Why this form of spasm is seen in epilepsy is difficult or impossible to say; it may be that there is a cellular change in the motor cortex, although Muller in a number of cases found no cellular change whatever. In some of Muller's cases, status hemiepilepticus occurred with death in a few instances.

CONCLUSION

Jacksonian spasm is by no means diagnostic of a lesion of the motor cortex. Probably the commone t cause of this form of spasm is idiopathic epilepsy itself, and a careful examination with close scrutiny of the facts and history may prevent many errors in diagnosis. A person with jacksonian epilepsy should not be operated on unless other signs and symptoms of intracranial disease are present.

For the use of cases I am indebted to Drs. Mills, Spiller, Anders and Potts.

5000 Walnut Street.

ACTION OF MERCUROCHROME-220 ON THE GONOCOCCUS *

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In a recent paper, Young, White and Swartz [1] presented the results of laboratory and clinical trials of mercurochrome-220, the first drug of the mercurochrome series to be extensively investigated. The laboratory work included in their paper comprises tests of the germicidal power of this drug against *B. coli* and *Staphylococcus aureus*. These tests were performed with a slight modification of the usual method for testing germicides, based on that recommended by Rideal and Walker.[2] The results showed a strikingly high germicidal power for this drug, with the further fact that its maximum action occurs in a short time. This characteristic distinguishes it from certain other drugs, such as the flavines, to secure the maximum effect of which contact must be maintained over a much longer period.

The new drug received clinical trials in this institute in cystitis, pyelitis, urethritis and venereal ulcerations. Its use in urethritis had to be based on the assumption that its germicidal power for the gonococcus would be analogous to that for the other organisms. It was felt, however, that such use should have a definite

* From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital, Baltimore, with the Aid of Funds granted by the United States Interdepartmental Hygiene Board for the Study of the Prevention and Cure of Venereal Diseases.

1. Young, H. H.; White, E. C., and Swartz, E. O.: A New Germicide for Use in the Genito-Urinary Tract: Mercurochrome-220, J. A. M. A. **73**: 1483 (Nov. 15) 1919.

2. Rideal and Walker: The Standardization of Disinfectants, J. Royal. San. Inst. **24**: 424, 1903.

laboratory foundation, and in addition, direct results with the gonococcus were needed in order to make the clinical observations apply to our problem of determining to what extent germicidal power runs parallel to therapeutic efficiency.

METHOD

Tests with the gonococcus could not at once be performed, owing to the absence of a suitable method. We therefore set about developing such a method.

TABLE 1.—RESULTS OF FIVE MINUTE TESTS ON MERCUROCHROME 220 *

	Strength of Solutions								Control
	1:200	1:400	1:800	1:1,200	1:1,600	1:2,000	1:4,000	1:6,000	
24-hour reading	0	0	0	0	0	0	0	+	+
48-hour reading	0	0	0	0	0	0	0	+	+
7 day reading	0	0	0	0	0	0	0	+	+
Tubes inoculated	+	+	+	+	+	+	+	+	+
24-hour reading	+	+	+	+	+	+	+	+	+
48-hour reading	+	+	+	+	+	+	+	+	+

* In this table, + indicates growth of gonococcus; 0, no growth of gonococcus.

The technic finally adapted has been fully described in a paper by Davis and Swartz.[3] The method of cultivating the gonococcus is that of Swartz [4]: *

One c.c. of the emulsion is pipetted into a centrifuge tube of diluted drug. The tube is placed in the water bath at 37.5 C. for eighteen minutes. At the end of this time, it is centrifuged at high speed for two minutes. The supernatant fluid is poured off, and a quantity of salt solution pipetted in. This makes the complete time of action of the drug twenty minutes. The tube is then spun a second time, and the wash fluid poured off. The gonococci settle readily in

TABLE 2.—RESULTS OF TWENTY MINUTE TESTS ON GONOCOCCI WITH MERCUROCHROME 220 IN FRESH SOLUTION *

	Strength of Solutions							Controls	
	1: 1,000	1: 2,000	1: 4,000	1: 8,000	1: 16,000	1: 32,000	1: 64,000	Water	Sodium Chlorid
24-hour reading	0	0	0	0	0	+	+	+	+
48-hour reading	0	0	0	0	0	+	+	+	+
7 day reading	0	0	0	0	0	+	+	+	+
Tubes inoculated	+	+	+	+	+				
24-hour reading	+	+	+	+	+				
48-hour reading	+	+	+	+	+				

* In this table, + indicates growth of gonococcus; 0, no growth of gonococcus.

the centrifuge, and form a compact mass at the tip of the tube, which can be transferred almost *en masse* to a tube of fresh medium. This is corked and incubated, as described by Swartz.[4] It is our custom to inoculate, after seven days, all tubes on which no growth has occurred, with fresh cultures of gonococci. If they develop, we assume that enough of the drug has not been carried over to the test medium to prevent growth. The final growths are examined microscopically with the Gram stain. None of the stains with which we worked grew on ordinary mediums.

RESULTS

Tests were made during periods of five and twenty minutes, the results of which are shown in Tables 1 and 2. These results may be compared with those obtained with drugs commonly employed in the treatment of gonorrhea, and shown by us in a recent paper.[5] If the dilution at which mercurochrome-220 kills gonococci in twenty minutes, 1:16,000, is divided by the dilution at which it may be used in the urethra, 1:50 (2 per cent.), it will be seen that this therapeutic strength is 320 times as strong as that necessary to kill.

In checking our results for the twenty-minute period, we used a stock solution of mercurochrome-220 which had been standing in the laboratory for some time, and were surprised to find that our tests no longer showed a killing at 1:16,000, but that growths occurred after treatment with strengths as high as 1:4,000. It seemed at first that the age of the solution could not be the cause of this discrepancy, since mercurochrome-220, as stated in the paper of Young, White and Swartz,[1] gives a

TABLE 3.—RESULTS OF TWENTY MINUTE TESTS ON GONOCOCCI WITH MERCUROCHROME 220 SOLUTION ONE MONTH OLD *

	Strength of Solutions					Controls	
	1:4,000	1:8,000	1:16,000	1:32,000	1:64,000	Water	Sodium Chlorid
24-hour reading	0	+	+	+	+	+	+
48-hour reading	0	+	+	+	+	+	+
7-day reading	0	+	+	+	+	+	+
Tubes inoculated	+						
24-hour reading	+						
48-hour reading	+						

* In this table, + indicates growth of gonococcus; 0, no growth of gonococcus.

permanent solution which shows no marked precipitation or other visible change on standing. Chemical tests revealed no decrease in the mercury content. Recently, Cullen and Levy [6] and Macht and Shohl [7] have shown that the change in reaction of certain drug solutions on standing in ordinary glass is sufficient to diminish or destroy their effects. The solution in question had been kept in a flask made of resistance glass,

TABLE 4.—RESULTS OF TWENTY MINUTE TESTS ON B. COLI WITH MERCUROCHROME 220 *

	Strength of Solutions								Controls	
	1: 25	1: 50	1: 100	1: 200	1: 400	1: 800	1: 1,600	1: 3,200	Water	Sodium Chlorid
24-hour reading	0	0	0	0	0	0	+†	+	+	+
48-hour reading	0	0	0	0	0	+	+	+	+	+
7-day reading	0	0	0	0	0	+	+	+	+	+
Tubes inoculated										
24-hour reading	+	+	+	+	+					
48-hour reading	+	+	+	+	+					

* Plus sign, growth of B. coli; 0, no growth of B. coli.
† Very few colonies.

and tests of its reaction detected no change. In order, however, to settle the point, new tests were made with a fresh solution, which killed at 1:16,000, as expected. The same solution was allowed to stand in a flask of

3. Davis, D. M., and Swartz, E. O.: The Testing of Germicidal Substances Against the Gonococcus, J. Infect. Dis. **27**: 391 (Dec.) 1920.
4. Swartz, E. O.: A New Culture Method for the Gonococcus, J. Urol. **4**: 325 (Aug.) 1920.
5. Swartz, E. O., and Davis, D. M.: The Action on Gonococcus of Various Drugs Commonly Used in the Prophylaxis and Treatment of Gonorrhea, J. Urol., to be published.
6. Levy, R. L., and Cullen, G. E.: Deterioration of Crystalline Strophanthin in Aqueous Solutions; Its Relation to Hydrogen Ion Concentration, and a Method for Its Prevention, J. Exper. Med. **21**: 267 (March) 1920.
7. Macht, D. I., and Shohl, A. T.: The Stability of Benzyl Alcohol Solutions, J. Pharmacol. & Exper. Therap., to be published.

pyrex glass for one month, and at the end of that time gave the results shown in Table 3. It is therefore apparent that some change, the nature of which we have not determined, occurs in solutions of mercurochrome-220 on standing which diminishes greatly its germicidal value.

Further tests were made with the same technic, but with *B. coli* and *Staphylococcus aureus* as the test organisms. The results are shown in Tables 4 and 5. These results differ somewhat from those of Young, White and Swartz,[1] but this difference is due to the different method employed. A full discussion of the factors involved will be found in the paper by Davis and Swartz.[2] A solution of mercurochrome-220 which will kill *B. coli* in twenty minutes is about forty times as concentrated as that required to kill the gonococcus in the same period. The staphylococcus required about four times the strength necessary for *B. coli*. These figures correspond well with those obtained with potassium mercuric iodid.[3]

In another series, emulsions containing different numbers of bacilli were used, all being treated with 1:4,000 mercurochrome-220. This series was undertaken simply to demonstrate the effect on the results of the number of organisms in the emulsion. The

TABLE 5.—RESULTS OF TWENTY MINUTE TESTS ON STAPHYLOCOCCUS AUREUS WITH MERCUROCHROME 220*

	Strength of Solutions							Controls	
	1:50	1:100	1:200	1:400	1:800	1:1,600	1:3,200	Water	Sodium Chlorid
24-hour reading	0	0	0	0	0	0	0	+	+
48-hour reading	+21	+11	0	+101	+501	+	+	+	+
7 day reading	....	....	0						
Tubes reinoculated	....	....	+						
24-hour reading	....	....	+						
48-hour reading	....	....	+						

* In this table, + indicates growth of staphylococcus, and 0, no growth of staphylococcus.
† Figures indicate number of colonies.

original emulsion, and a 1:10 dilution of it, grew after treatment with 1:4,000 mercurochrome-220. A 1:100,000 dilution, however, showed no growth after treatment with the drug, while a plate made directly from 1 c.c. of the same dilution had a great many colonies (about 10,000, calculating from the plates of weaker dilutions). It may be inferred from these figures that the technic used in this paper gives the test drug a difficult task, since it must act in such a heavy emulsion, and is brought in contact with at least as many organisms as will be the case in the urethra, and probably many more.

COMMENT

These experiments demonstrate that mercurochrome-220 has a powerful germicidal action against the gonococcus. In clinical trials, while it has proved to be a useful agent in the treatment of gonorrhea, it is not a panacea for all gonococcal infections. We have reason to believe, however, that it by no means represents the maximum germicidal potency which it will be possible to attain in the mercurochrome series.

Our results showing a rather rapid decline in the germicidal power of mercurochrome-220 when its solutions are allowed to stand are of importance to those who have used this drug therapeutically. Owing to the apparent stability of the solutions, many have made them up in large quantities, to be used as occasion offered. This may explain many of the conflicting clinical results, and failures to obtain the expected effects. Solutions of mercurochrome-220 should undoubtedly be made freshly for clinical use.

CONCLUSIONS

1. Mercurochrome-220 shows a powerful germicidal effect against the gonococcus.

2. The gonococcus is about forty times as susceptible to the action of mercurochrome-220 as *B. coli*.

3. Solutions of mercurochrome-220 lose their germicidal potency on standing, and should therefore be used only when freshly made.

POSTURAL REST FOR PULMONARY TUBERCULOSIS

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Of the countless methods suggested and tried in the treatment of the various forms of tuberculosis, that which has more and more gained approval, from its successful application, has been the principle of rest. Applied first by surgeons to the treatment of tuberculosis of the spine and of the joints, rest has more recently been approved in tuberculosis of the larynx by the enjoining of silence over an unlimited period, and in pulmonary tuberculosis by the application of artificial pneumothorax.

Curiously, physicians have never thoroughly carried out the simple procedure of postural rest in the treatment of patients with pulmonary tuberculosis. In a former paper,[1] we first called attention to this neglect. Since that time so many more excellent results in more than 200 patients have been obtained, and at the same time so little attention has been given to the subject by those who specialize in pulmonary tuberculosis, that we may be excused for again presenting this principle. The failures encountered have been in patients either too far advanced with bilateral disease, or in those considered favorable for the application of this procedure, but who failed to carry it out faithfully.

The majority of patients afflicted with pulmonary tuberculosis are instructed at some time by their physicians to rest in bed. This, however, is as far as the average physician carries out his idea of rest for the lungs. The fact is overlooked that the patients may have a special preference for the side on which they recline. If they are not guided, it will be found that the majority will rest on the side of the least diseased or normal lung, because in this position their expectoration drains more easily. It is a simple matter to note, with the stethoscope, the feebleness of the respiratory murmur of the recumbent lung, and the possible exaggerated breath sounds of the uppermost lung when a normal person is lying on one side. Although pulmonary tuberculosis is eventually a bilateral disease, yet in general one lung is likely to be more involved at the onset, and later more actively diseased than the

1. Webb, G. B.; Forster, A. M., and Houck, F. M.: Rest of the Individual Lung by Posture, J. A. M. A. 67: 1422 (Nov. 11) 1916.

other. These conditions are, of course, recognized in the application of artificial pneumothorax.

Normal respiration takes place more than 1,000 times an hour, and more than 24,000 times in twenty-four hours. Should a patient with a tuberculous lesion of the upper lobe of the right lung be permitted to spend much time resting in bed on his left side, it must be considered that movement of the diseased lung will take place 1,000 times each hour! What would be the healing result in a tuberculous joint should even slight motion 1,000 times an hour be allowed?

As we before pointed out, the majority of individuals prefer sleeping on the right side. Of 529 healthy soldiers investigated, the sleeping position resulted about as follows: right side, 48 per cent.; left side, 23 per cent.; either side, 20 per cent.; back, 8 per cent., and stomach, 1 per cent. Several factors appear to determine the position taken in sleep, such as basal obstruction, the desire to avoid the light, and the consciousness of the heart beat.

The movements of the chest and of the diaphragm have been studied with the fluoroscope in persons lying on one side. Briefly, the ribs of the recumbent lung are close together, and there is less motion of this side than of the uppermost lung. The diaphragm on the side of the recumbent lung is seen to make greater excursions than that of the uppermost lung. From some observations that we have made, this increase soon subsides.

Pulmonary tuberculosis is usually in the early phase a disease of the upper lobes, and the movement of these lobes is easily controlled by postural rest. As a matter of practical experience we have not noted that postural rest, with the preliminary increased excursion of the diaphragm, brings any disaster to patients when the disease has involved the lower lobe. Usually when such a phase of the disease is reached, pleural adhesions are likely to prevail, and these possibly modify the motion of the diaphragm.

In the normal person there is little hyperemia of the dependent lung during sleep. In a tuberculous patient a moderate degree of hyperemia is produced by prolonged rest on the affected side. Certainly such prolonged rest does naturally assist in the moving over of the heart and of the mediastinum to the side of the more diseased and dependent lung. We have seen the heart drawn over and fixed much more rapidly than would be usual without postural rest.

It may be objected that the complete application of postural rest is an unnecessary and a severe form of treatment. It has been surprising, however, to observe how kindly and thoroughly patients will accept the procedure if led to it gradually. In patients with much expectoration, a short time several times a day is allowed to be spent lying on the less affected lung. This accelerates drainage. The patient then turns on the side of the more diseased organ, beginning with only a few minutes and gradually increasing the time until twenty hours or more a day are spent lying in this position. A small pillow is often placed under the ribs to increase the splinting effect. Results are obtained in a few weeks by the application of this thorough rest which are comparable to those obtained more quickly by artificial pneumothorax. Fever will subside, cough will cease, and sputum of many ounces may decrease to a mere trace. It has been of special interest to note the decrease and at times almost complete disappearance of râles. Many patients, considered as certainly requiring the application of artificial pneumothorax, have been restored to health by this simple procedure. A few cases may serve to illustrate the method and the results:

REPORT OF CASES

Case 1.—Mrs. M., aged 35, sent to Colorado by her physician with the request that artificial pneumothorax be applied, had active disease with softening in the upper lobe of the right lung. There was expectoration of 3 ounces, and continued fever with somewhat severe exacerbations every few weeks. The patient was kept in bed on a sleeping porch three months, with no improvement. During a visit one afternoon, the patient was found asleep. It was noted that she was sleeping soundly on her left side. The increased motion of the right side was noted. On waking, the patient reported that she always had favored the left sleeping posture, and that most of her day was so spent. The method of postural rest was then explained. This was by degrees carried out very thoroughly. All symptoms gradually improved, and in six months all sputum had disappeared and the râles in the upper right lobe had greatly diminished. Within a year the patient was allowed to go to her eastern home, the râles having completely vanished. The patient has been seen at times since, and the arrest of the disease has persisted.

Case 2.—Mr. G., aged 36, had extensive tuberculosis of the right lung, with a cavity in the upper lobe, and slight involvement of the left lung. The daily temperature rose to 100 and 101. Sputum was 6 ounces daily. The patient resided in a private cottage He was instructed to rest on the right side. After three months his condition was unimproved. Artificial pneumothorax was unsuccessfully attempted. The patient had had a diagnosis of tabes dorsalis made by a well known eastern neurologist, because of repeated attacks of supposed gastric crises, coupled with a definite history of syphilis. Two intravenous injections of arsphenamin were given: no effect on the tuberculous disease was noted. A consultant advocated the intrathecal injection of arsphenamin. While undergoing this treatment the patient was instructed that he must absolutely keep flat in bed and not raise the head, and that the right side posture must be maintained. Six doses were given at weekly intervals. Within two days after the first intrathecal injection of arsphenamized serum the temperature dropped to normal and the sputum gradually diminished to a mere trace in twenty-four hours. We were at a loss to explain this sudden and marked improvement. We learned, however, that the patient had not carried out the postural rest at first as we had prescribed it. He thought there was little harm in going to the toilet several times a day, in sitting up to meals, and in resting in a reclining chair. He was soon convinced of the efficacy of the proper carrying out of postural rest. The cavity and the area of involvement had markedly shrunk, and the heart and mediastinum have definitely moved across the chest.

This case taught us how much more thoroughly we should insist that the procedure of postural rest must be carried out.

Case 3.—A man, aged 20, had an early lesion of the right upper lobe. The temperature on admission went to 99.4. There was very slight cough and expectoration. He was in bed on the right side for two months. At the end of three weeks the temperature was normal. At the end of two months he had gained 20 pounds. The râles in the right upper lobe were definitely less.

Case 4.—A man, aged 22, had extensive involvement of the entire left lung, with slight signs in the right apex. He was in bed eight months on the left side. On admission the temperature rose to 100, and there was considerable cough and expectoration. At the end of eight months the patient was up and on exercise, with temperature normal, a gain in weight of 16 pounds, and with no cough or expectoration. The increased signs of fibrosis in this case were marked.

Case 5.—A man, aged 22, had a far advanced lesion of the entire right lung with signs indicating beginning breaking down in the upper lobe, and slight signs in the left upper lobe. The temperature on admission was 100.5. Cough was excessive. The sputum was 6 ounces. After four months on

the right side the temperature did not go above 99, there was a gain of 22 pounds, and the patient did not cough or expectorate for several days at a time. The sputum never exceeded 2 or three drams. For the first few weeks he noticed a definite increase in sputum, but the cough was diminished from the first. There was definite evidence of increase in fibrosis, with no increase in signs of softening.

CASE 6.—A woman, aged 31, had a far advanced lesion of the left upper lobe with signs suggesting a cavity at the left

Fig. 1.—Normal chest, subject lying on back. This and the accompanying roentgenograms were taken of a normal young man, and are anteroposterior views.

apex, some involvement of the left lower lobe and fibrosis of the right upper lobe, but no signs of activity. This patient had been in Colorado for four years and had had periods of improvement but frequent exacerbations, cough was troublesome and she had about 2 ounces of sputum. After six months on the left side there is marked improvement in the physical signs, the cough and sputum have practically disappeared, the temperature is normal, and there has been no interruption in the improvement of the patient.

CASE 7.—A woman, aged 22, had an advanced lesion involving the entire left lung, with slight signs in the right upper lobe. The temperature on admission was 99.5. There were marked signs of fibrosis in this case on admission, but it is reported because in six weeks of postural rest all elevation of temperature, cough and expectoration had disappeared. The gain in weight was 12 pounds.

CASE 8.—A man, aged 23, had a far advanced lesion of the entire left lung, with slight signs in the right upper lobe. The temperature was normal, the sputum 1 ounce. On account of the fact that this patient had been under treatment for two years and desired to finish his medical course, pneumothorax was attempted several times without result. There were periodic marked increases in the cough and sputum, but without elevation of temperature. After four months on the left side the cough and sputum had entirely disappeared except for the periodic attacks, and these have very markedly decreased in frequency and severity. There has been definite improvement in the physical signs.

CASE 9.—A man, aged 22, had excessive involvement of the left upper lobe, with some signs in the left lower and the right upper lobe. He had been in Texas and Colorado for about a year, and the physical signs had apparently increased. From the condition of the left apex one would fear an early breaking down process. Cough was troublesome and sputum was about 1 ounce. The temperature was normal. After three months on the left side, cough and sputum practically disappeared. The lesion is apparently quiescent.

CASE 10.—A man, aged 26, had far advanced involvement of the entire right lung, with numerous râles, particularly over the base. There was slight involvement of the left upper lobe. The patient had been in bed at home for eight months before coming to us (*on the left side*) with no improvement. Cough was excessive and sputum over 4 ounces. There was elevation of temperature to 101. After seven months on the right side there has been a gain of 24 pounds. The temperature is normal, cough and expectoration have practically disappeared, and evidence of moisture in the right side is markedly diminished.

CASE 11.—A man, aged 34, had an extensive old fibrous lesion of the right upper and middle lobes, and an active lesion (more recent) of the left upper lobe. The patient was first put on the left side, and after eight months there was definite evidence of fibrosis, with marked diminution in the number of râles. Following a "cold" last winter there was evidence of lighting up of activity in the lower border of the lesion on the right, and râles appeared. The patient was then advised to lie on the right side, and after four months the signs on the right have practically disappeared.

COMMENT

We have had few patients in whom we could detect no change in signs or symptoms referable to the advice to lie on the active side. We have had several patients in whom improvement was noted, but resort to pneumothorax was necessary on account of the far advanced condition of the bad lung. In general, however, far fewer patients than formerly have needed treatment by pneumothorax.

We have noted several patients who apparently had instinctively rested the affected lung. One patient, in particular, had been lying on the right side since the disease developed seven years before. He had served in the army, and broke down only as a result of strenuous work.

In many patients, signs of cavitation in the upper lobe have entirely disappeared.

The procedure is also of value in patients with pulmonary hemorrhages. Eighteen years ago in one of

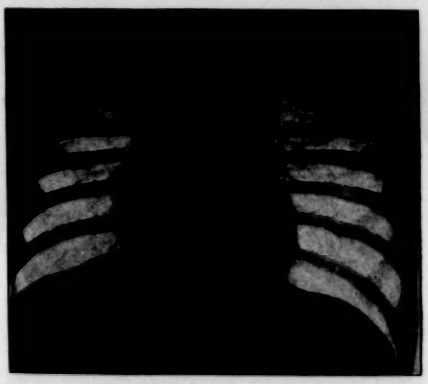

Fig. 2.—Appearance after subject has lain on right side one minute. Notice slight displacement of heart compared with Figure 1.

our earliest cases, previously reported, with extensive disease of the left lung and with a series of hemorrhages, postural rest on the left side appeared to arrest the bleeding, and today, after eighteen years, the patient is in active work as a stenographer.

It cannot be too strongly insisted that postural rest must be most thoroughly carried out, careful nursing

and care being given that sores on the recumbent ear, shoulder or hip shall not occur. The bed must be so arranged that the patient is not annoyed by light. A small, firm pillow under the recumbent side is helpful.

The almost complete disappearance of râles in many cases has led us to allow graduated exercise—sitting up, walking—too soon, so that râles have returned, although rarely have subjective signs returned.

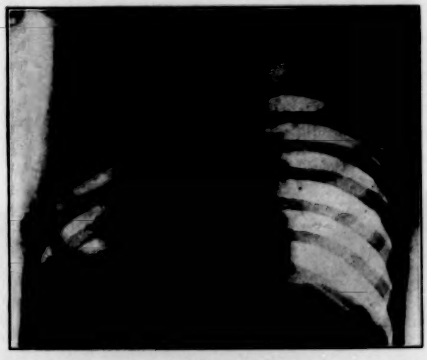

Fig. 3.—Appearance after subject has lain one hour on right side. Notice diminution of lung volume, closer proximity of right side ribs, high position of diaphragm, marked displacement of heart to right, and lack of aeration of right lung.

Just as in the postural treatment of tuberculous joints by surgeons, our confrères are not guided by disappearance of fever, increase of weight, or closing of sinuses, in respect to their taking away splints, so postural rest in pulmonary tuberculosis should be continued for many months after expectoration has diminished or ceased, or the temperature has remained normal. Such, indeed, is the usual procedure in artificial pneumothorax.

Pulmonary tuberculosis is likely to be unilateral when first discovered, and naturally these are the cases in which the greatest benefit will be derived. Should both lungs be diseased, one is usually the more active, and this should be rested. Should the disease be found equally active and advanced on the two sides, rest on the back is advocated. Bags of shot, the weight being gradually increased, can be placed over each upper lobe.

We are convinced that postural rest in pulmonary tuberculosis carried out with surgical splint thoroughness is the most valuable means we have at hand for the arrest and cure of this disease.

SOME ROENTGEN-RAY STUDIES

In 1917 at U. S. General Hospital No. 1, one of us (G. B. W.) made some fluoroscopic observations on the chest of a normal man recumbent on one side. The studies were interrupted, but they indicated that the increase in the excursion (about 2 inches) of the diaphragm of the lower side, and the lessened excursion (about ¾ inch) of the diaphragm on the upper side, became gradually equalized after an hour.

It has been objected that postural rest in pulmonary tuberculosis might be injurious because of the increase in excursion of the diaphragm on the side of the recumbent lung.

As we have pointed out in a former paper, on the recumbent side it will be noted that the breath sounds are more feeble, the ribs more closely approximated and that the heart is rapidly pulled to that side, owing in part to gravity.

The roentgen-ray studies have been more recently continued, the results being easily seen in the accompanying reproductions.

It will be noted that after rest for one hour on one side in a normal subject, the diaphragm is relatively high on that side, the heart is markedly moved over to that side, in some cases observed nearly 4 inches, the ribs are closer together, the lung volume is remarkably diminished, and the lung picture is obscured on account of the lack of aeration.

A subject at this time, on taking a deep inspiration, increases the aeration and so the transparence at the base, but the apex still does not illuminate, as will be seen.

Fluoroscopic study confirms all these findings, and in addition the increase of the excursion of the lower diaphragm gradually lessens and at the end of an hour in some cases, there is practically no difference on the two sides.

The possible explanation for the initial increase in excursion would seem twofold: The compression of the upper lobe might lead to compensatory increase in movement of the lower lobe. Since rest should diminish the demands of respiration, it would seem that this may not be necessary. It has occurred to us that the abdominal viscera dropping to the recumbent side force up the diaphragm, and this muscle would at first respond by increase in excursion. After some time,

Fig. 4.—Subject has taken deep inspiration. Notice increase in illumination of right lung base; no increase in aeration of right apex.

continued pressure of the abdominal viscera almost "splints" the diaphragm in its higher relative position. These roentgen-ray studies appear to us fully to justify the thorough application of the principle of postural rest in pulmonary tuberculosis, and certainly confirm us in advising that the procedure be given wide, thorough and complete trial.

THE EFFECT OF PHOSPHORUS IN RICKETS *

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AND

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In a previous report, Phemister [1] showed in roentgen-ray studies the influence of phosphorus on the growth of normal bones and the bones in the growth disturbances of osteogenesis imperfecta and dyschondroplasia. A dense shadow formed at the growing ends of the shafts, which gradually increased in thickness as long as the phosphorus was given, but gradually faded after the discontinuance of the drug, and with further longitudinal growth of the shaft came to lie at a greater distance from the epiphysis. When phosphorus was again given, a similar line formed, which in turn faded after the phosphorus was stopped, and was carried deeper into the end of the shaft by subsequent growth. For some time after the discontinuance of the drug a slight excess in density was to be seen along the line of bone growth at the end of the shaft. Similar shadows formed about the periphery of the ossifying epiphyses, but were much narrower, owing to the slower rate of bone growth in this location. No influence on the transverse growth of the shaft could be seen in the roentgenograms that were made of normal bones, but in osteogenesis imperfecta the influence was as striking as on the longitudinal growth.

Fig. 1. — Dense zone produced by phosphorus in end of radius in young dog.

Fig. 2.—Microscopic appearance of dense zone of ossification in Figure 1 at its junction with (a) cartilaginous epiphyseal line; (b) crowded bony trabeculae.

* From the Presbyterian Hospital.

1. Phemister, D. B.: The Effect of Phosphorus on Growing, Normal and Diseased Bones, J. A. M. A. 70: 1737 (June 8) 1918.

Wegner's experiments on dogs have been repeated by Miller and Phemister, and his findings partially confirmed. The shadows are found to be due to a layer of densely packed, longitudinally arranged bony trabeculae that form from excessive activity in the zone of ossification at the end of the shaft. The adjacent zone of calcification, which is the only other portion which might possibly produce such a roentgenologic appearance, is not appreciably affected. Figure 1 shows the effect of $\frac{1}{200}$ grain of phosphorus twice daily for sixty-three days on the lower end of the radius of a young dog, and Figure 2 the microscopic appearance of its zone of ossification. No appreciable increase could be seen in the transverse growth of the shafts.

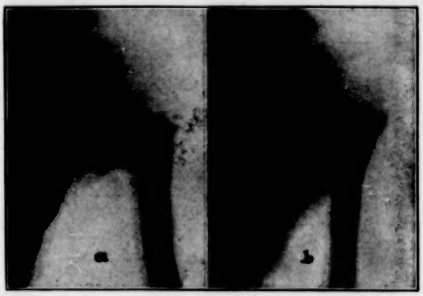

Fig. 3 (Case 1).—Rickets in upper end of humerus: *a*, before treatment; note faint shadow of epiphysis and end of shaft; *b*, forty-seven days after beginning of treatment.

Fig. 4 (Case 1).—Forearm after sixteen days of phosphorus and cod liver oil treatment. Rickets still definite, but faint lines forming.

In the previous article this was suggested as a convenient way of demonstrating the effect of various

therapeutic agents, such as phosphorus, cod liver oil and lime salts, on the bones in rickets, as compared with the indirect methods of Schabod and Schloss, based on calcium metabolism studies. An incomplete study of the influence of phosphorus and cod liver oil and of phosphorus alone has been made, and the cases

Fig. 5 (Case 1).—Same as Figure 4, forty-seven days after beginning of treatment. Note single dense lines at distal ends of second to fifth metacarpals.

reported below show some of the changes observed. The first two show the influence of phosphorus and cod liver oil, and the last two that of phosphorus alone. The findings are of interest in connection with the observations of Howland and Park as to the effects of cod liver oil alone on the bones in rickets. The patients presented the usual picture of rickets; consequently, their histories are not given in detail.

REPORT OF CASES

CASE 1.—D. P., aged 8 months, who had been fed on artificial food, entered the Presbyterian Hospital, Nov. 18, 1919, in the service of Dr. Grulee, with symptoms and findings of moderate rickets. Roentgen-ray examination gave typical rachitic findings. The ends of the bones of the forearm, arm and leg showed basket-shaped expansion of the juxta-epiphyseal portions and a frayed out condition of the end of the shaft. This change was most marked in the upper end of the humerus (Fig. 3*a*) and the lower end of the radius, ulna and tibia, where growth was most marked. The child was fed on a 6 ounce mixture every four hours, consisting of whole milk, 15 ounces, water, 9 ounces, and sucrose, ½ ounce, and was put on 1 dram of cod liver oil and $\frac{1}{150}$ grain of phosphorus three times daily. Roentgenograms taken December 4 (Fig. 4) disclosed signs of beginning ossification. There was a faint, irregular, double line at the ends of the shafts, forming the limits of the frayed out juxta-epiphyseal segment. The treatment was continued and new pictures were taken, Jan. 10, 1920 (Figs. 3*b*, 5 and 6). The two lines at the end had increased in density, and the distal one bordering on the epiphyseal cartilage was thicker than the proximal, and irregular especially along its epiphyseal side, where in some regions, as the upper end of the tibia, there were small, tooth-like projections into the epiphyseal cartilage. A narrow, porous zone separated the two lines. There was slight increase in density of the shafts of the bones. The distal ends of the shafts of the second to the fifth metacarpal bones (Fig. 5), which presented no evidence of rickets in the first plates, showed a single dense line similar to that produced by phosphorus administration in normal bones. The treatment was continued until March 1, and the child returned, March 24, when roentgenograms were again taken (Figs. 7 and 8). These showed complete disappearance of the rachitic process, with the ends of the shafts normal aside from faint transverse striations, with the heaviest shadow along the zone of ossification. The centers of ossification in the epiphyses showed a narrow, dense shadow about the periphery, and the ends of the metacarpals still showed the dense lines as in the previous plates. Subsequent roentgenograms, taken May 12, disclosed the rachitic process healed and slight traces of the transverse striation of the metaphyses. The shadows in the metacarpals were markedly faded, and a double line could now be made out in some of them.

CASE 2.—S. F., a boy, aged 2 years 9 months, entered the Presbyterian Hospital, March 13, 1920, with the usual symptoms and signs of severe rickets. Roentgenograms of the extremities, March 17 (Fig. 9), revealed marked rachitic changes. The shafts of some of the bones were slightly

Fig. 6 (Case 1). — Leg bones, forty-seven days after beginning of treatment. Note heavy double lines at ends of shafts.

Fig. 7 (Case 1). — Seventy-three days after beginning of treatment and twenty-four days after treatment was stopped. Rickets healed.

curved, and the cortices everywhere were thin and osteoporotic. There was periosteal new bone formation, especially along the convex-surface of the curved bones. The ends of the shafts were expanded, and cast very feeble, basket-shaped

shadows. The centers of ossification of the epiphyses, that normally should be present, were scarcely visible. The child was put on regular hospital diet, including orange juice three

Fig. 8 (Case 1).—Seventy-three days after beginning of treatment and twenty-four days after treatment was stopped. Rickets healed.

Fig. 9 (Case 2).—Severe rickets, before treatment.

times daily, and cod liver oil, 1 dram, and phosphorus, 1/150 grain, three times a day for seven weeks. He was soon markedly improved and began walking. He then left the hospital, but continued to take the medicine, and returned, June 8, when roentgenograms were again taken (Fig. 10). These showed marked improvement in the condition of the bones. The cortex of the shafts had increased in thickness and density, and the ends of the shafts now cast shadows of normal density. There was a dense, heavy line at the limits of the shafts, corresponding to a thickened heavy zone of ossification. The centers of ossification of the epiphyses and short bones were definitely denser. The child was then put on 1/100 grain of phosphorus, three times a day, and returned, September 16, when roentgenograms were again taken (Fig. 11). These revealed further growth of the bones, but no definite increase in density of the lines at the ends of the shafts, although a denser shadow was seen about the periphery of the centers of ossification of some of the epiphyses and short bones of the carpus and tarsus. The last effect corresponds somewhat to that obtained by administering phosphorus when the bones are healthy.

Cases 3 and 4 illustrate the effect of phosphorus alone.

CASE 3.—Bessie C., aged 2 years 10 months, came to the hospital, July 10, 1920, with the picture of long-standing, moderately severe rickets. The child had been walking for some weeks. Roentgenograms of the extremities revealed osteoporotic shafts with marked curvature of the tibiae and fibulae, with periosteal apposition along their concave surfaces. The shadows of the ends of the shafts were markedly expanded and faint, and the centers of ossification of the epiphyses cast faint shadows with irregular outlines. The child was treated ambulatorily, no change being made in its former hygienic or dietetic conditions. Phosphorus pills, 1/100 grain, were prescribed three times a day, but on return, August 23, it was found that only ten pills had been taken during this time. Roentgenograms (Fig. 12*a*) disclosed practically no change in the condition of the bones. Arrangements were made whereby the medicine was given regularly, and roentgenograms were taken, November 3 (Fig. 12*b*), which revealed a very striking change in the bones. There was great increase in density of the former osteoporotic portions of the shafts, metaphyses and epiphyses, and the rachitic changes, aside from the remaining curvatures, had disappeared. The ends of the shafts showed a dense, narrow line along the zone of ossification, and the metaphyses of some of the bones, as the upper end of the tibia, showed transverse striations. The improvement was as striking in this case, in which phosphorus alone was given, as in the previous cases, in which phosphorus and cod liver oil were administered.

CASE 4.—G. H., a boy, aged 8¾ months, artificially fed, when seen, June 10, 1920, had symptoms and gave findings of active rickets. Roentgenograms disclosed mild rachitic changes. The upper end of the fibula showed extensive, and the lower end of the femur slight, fraying expansion. The child was given 1/150 grain of phosphorus in the form of an elixir three times daily and a diet of modified milk and vegetable soup. Fifty-five days after the treatment was started, his condition was improved, and roentgenograms revealed the disappearance of the rachitic changes.

Fig. 10 (Case 2).—After eighty-three days of phosphorus and cod liver oil treatment. Active rickets healed.

COMMENT

The end-results produced by phosphorus, and the combination of phosphorus and cod liver oil were quite

similar. The rarefied areas of the rachitic bones acquired an approximately normal density in both instances. In Case 1, in which the patient received

Fig. 11 (Case 2).—After 100 days of phosphorus treatment.

phosphorus and cod liver oil, the intermediary stages of healing were studied, and ossification of the rarefied zone at the ends of the shafts was seen to occur by the formation of two transverse irregular lines at its limits, which gradually increased in thickness, the distal one apparently more rapidly than the proximal, until fusion occurred. After this there was some reduction in density of the newly ossified zone and a rearangement of trabeculae, corresponding roughly to the normal. However, a transverse line was seen in the end of the metaphysis, and faint striation of the deeper portions was sometimes to be made out. The metacarpal bones, which were without demonstrable evidence of rickets, showed one dense line at the end of the shaft, resembling closely the changes produced by phosphorus in normal growing bones. This persisted after the rachitic bones were healed.

Case 2 showed striking ossification and growth of the rarefied bones during the period of administration of phosphorus and cod liver oil. A denser line was present at the end of the shaft than in Case 1. Roentgenograms at the end of the second period, during which phosphorus alone was given, showed much the same condition, with slightly heavier lines about the periphery of the short bones. The rachitic process was practically healed before the phosphorus alone was started, and the drug seems to have had little influence on subsequent bone growth. This may have been due to an inappropriate dose of phosphorus, as in animals a dose one-half or one-third that found necessary to produce the lines will have no effect whatever.

The third case, in which phosphorus alone was given, showed fully as marked ossification of the rarefied bones as did the others, and with complete disappearance of the active signs of rickets. The ends of the shafts returned to normal density except for irregularity in the trabeculae and the presence of a dense line at the ends, which is somewhat narrower than that produced by phosphorus administration when the bones are normal.

Howland and Park [2] have made extensive studies of the effect of cod liver oil alone on rickets. Their findings are very similar to those in Case 1. Prompt healing was obtained with the formation of a double line in the juxta-epiphyseal region of the shaft and ossification of other rarefied areas of the bones.

Similar results to those here reported were observed in three other cases in which the patients were treated with phosphorus and cod liver oil, but these two are the only cases in which the effect of phosphorus alone has been studied. While they suggest that phosphorus alone may cause equally prompt healing of rickets, further observations will be necessary to clear up the point. Careful comparisons should be made between the effects produced by phosphorus alone, cod liver oil alone, and a combination of the two.

The method of action is little understood. In the case of cod liver oil the result might be attributed to the presence of fat soluble A, but this could not be the explanation for the action of phosphorus. There is a

Fig. 12 (Case 3).—a, severe rickets, before treatment; b, after 106 days of phosphorus treatment.

trace of phosphorus in cod liver oil in organic combination, but it is improbable that it is present in suffi-

2. Howland, John, and Park, E. A.: Some Observations on Rickets, Tr. Am. Pediat. Soc., 1920.

cient quantity to exert any influence. Clearly phosphorus, and also cod liver oil, in some way restore the power of normal ossification, which in rickets is temporarily lost. This refutes the contention of Wegner, who thought phosphorus incapable of assisting in ossification in rickets until some other factor restored the altered calcium metabolism to normal.

SOME FACTORS RELATING TO THE TOXIC ACTION OF ARSPHENAMIN *

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There is little unanimity of opinion as to the cause of the untoward effects that not infrequently follow the administration of arsphenamin. Some apparently believe that, with the present quality of arsphenamin on the American market, untoward reactions must be ascribed to carelessness on the part of the physician; but just how this carelessness operates—what physical or chemical changes are brought about in the drug, for example, or what physiologic effects are supposed to be caused by the use of too concentrated solutions or by too rapid injection—is not stated. On the other hand, some clinicians think that the quality of the drug is almost always at fault when untoward results are obtained.[1]

Without entering on a discussion of this question, the fact remains that there have been wide variations in the toxicity of preparations of arsphenamin not only as they are prepared by standard methods in different laboratories, but also among those on the market, and that the average of the commercial products is below that of preparations which may readily be made in the experimental laboratory. It is the purpose of the work (of which this is a preliminary report) in progress in this laboratory to investigate the causes of this difference and also the changes, chemical or physical, by which a "good" preparation may lead to untoward results.

TYPES OF TOXIC ACTION

It may be stated at once that in experimental studies both with commercial preparations and with preparations prepared by Mr. Christiansen in this laboratory, three distinct types of toxic action have been observed: (*a*) preparations the toxicity of which was due to the presence of m-amino-p-hydroxyphenylarsenous oxid ("arsenoxid"); (*b*) preparations the toxicity of which seemed to be due to the presence in the manufactured product of toxic substances other than the above mentioned oxid, and (*c*) preparations toxic on account of the physical properties of the solution or of the presence in them of a very easily destroyed toxic substance.

The third of the foregoing classes of preparations will be chiefly considered in this paper, but a few words may be said in regard to the other two.

TOXICITY DUE TO THE PRESENCE OF "ARSENOXID"

Ehrlich attributed the toxic action of arsphenamin largely to the formation of m-amino-p-hydroxyphenylarsenous oxid ("arsenoxid"), and this has been the most frequently discussed possibility. The possibility of this oxid's being involved in some of the clinical reactions of arsphenamin has recently again been raised by Smith [2] on the basis of a pharmacologic study of its action. A number of workers, however, have shown that there is a lack of parallelism between the amount of this oxid present in samples of arsphenamin and the toxic action of the latter, so that it cannot be the sole cause of untoward reactions.

I have not encountered a toxic commercial preparation of arsphenamin or an experimental preparation (except when special care was taken during the manufacture to secure such) the toxicity of which could be attributed to the oxid. But the evidence at present available suggests that the chief, if not the only, change leading to increased toxicity occurring in solutions of arsphenamin as the result of standing, shaking, or warming in the presence of air is due to the formation of this oxid or an analogous substance. Ehrlich [3] reported that the toxicity of a solution of arsphenamin became one and a half times greater when the solution was allowed to stand exposed to the air for four hours.

Roth [4] is apparently the only one who has published figures as to the increased toxicity of arsphenamin when alkaline solutions are shaken in the presence of air; he found that the toxicity of the preparation with which he worked increased 60 per cent. after one minute's vigorous shaking. Unfortunately, Roth reports results with only a single preparation. I have aerated alkaline solutions by drawing a slow current of air (first passed through sodium hydroxid to remove the carbon dioxid) through them at room temperature and found great variations in the effects on different preparations. With some preparations there was a marked increase in the toxicity within an hour; with others there was little change until after four hours' aeration, although the rate at which the air was drawn through was approximately the same. Voegtlin and Smith [5] have followed the oxidation of alkaline solutions of arsphenamin quantitatively without, however, recording the changes in toxicity.

In toxicologic experiments it has been assumed rather than actually demonstrated that the increased toxicity was due to oxidation. My experiments offer a certain amount of proof that the oxid, or at least a partially oxidized but at the same time easily reducible substance, is the chief factor.

In the first place, the symptoms produced by a specimen of arsphenamin which has been aerated or shaken are those characteristic of the oxid and are quite unlike those caused by other, unknown, toxic factors which will be discussed in the next section. These symptoms consist (in rats) in struggling, convulsive movements, lashing of the tail, rigidity of the legs, irregular respiration with long pauses, protrusion of the eyes, lacrimation and salivation; they begin promptly, often before the injection is completed. Roth has aptly described these symptoms as a "resistance to the injection." I have endeavored to determine how small an amount of oxid either alone or mixed with arsphenamin could, with a high degree of probability, be detected by the symptoms; the symptoms were distinct with

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* The experiments described in this report were begun under the auspices of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association, and are being continued under a grant from the United States Interdepartmental Social Hygiene Board.

1. Compare, for example, Pusey, W. A.: Administration of Arsphenamin, J. A. M. A. 73:1786 (June 14) 1919.

2. Smith, M. I.: J. Pharmacol. & Exper. Therap. 15:279 (June) 1920.

3. Ehrlich, P.: Abhandlungen über Salvarsan 3, 1913.

4. Roth, G. B.: Pub. Health Rep. 35:2205 (Sept. 17) 1920; Toxicity of Arsphenamin and Neo-Arsphenamin, Arch. Dermat. & Syph. 2:292 (Sept.) 1920.

5. Voegtlin, C., and Smith, H. W.: J. Pharmacol. & Exper. Therap. 16:199, 1920.

5 mg. per kilogram of rat (about one-fifth the fatal dose) and very pronounced with 10 mg. per kilogram. When 10 per cent. of arsphenamin in a sample was replaced by an equal weight of the oxid and injected into rats in doses of from 100 to 120 mg. per kilogram, the symptoms were characteristic of the oxid, and entirely unlike those caused by any other compounds I have tested, with the exception of the analogous sulphid.

Another indication that the oxid is the toxic agent in samples of arsphenamin which have been agitated with air is the fact that such solutions may be rendered relatively nontoxic by the means that reduce the toxicity of the oxid. Thus, if sodium hydrosulphite is added to a solution of the "oxid," the toxicity is immediately reduced; I have not determined the limit of this detoxication, but have found that more than double the fatal dose of the oxid could be rendered nontoxic by this means. If a solution of arsphenamin is rendered toxic by aeration, the typical "oxid" symptoms and the increased toxicity can be at once overcome by sodium hydrosulphite. Thus, a preparation of arsphenamin which did not kill in doses of 100 mg. per kilogram was aerated by drawing air through it at room temperature until it produced typical oxid symptoms and killed in a dose of 60 mg. per kilogram; sodium hydrosulphite was added; now doses of 100 mg. caused neither symptoms nor death.

A solution of arsphenamin made toxic by aeration at room temperature can also be rendered less toxic by continued aeration with warming. Thus, part of the toxic solution used in the foregoing experiment was aerated for two hours at a temperature varying from 45 to 60 C.; the injection of what corresponded to 100 mg. per kilogram caused no immediate symptoms; and although later tremors and a tendency to circus movements developed, the rats ultimately completely recovered; as noted above, this solution before the second aeration produced immediate "oxid" symptoms and caused death in doses corresponding to 60 mg. per kilogram. The toxicity of a solution of m-amino-p-hydroxyphenylarsenous oxid could be lowered in a similar manner by aeration. Thus, an alkaline solution of the oxid was aerated at about 50 C. for an hour and a half; doses corresponding to 80 mg. per kilogram of the oxid caused no symptoms whatever and did not cause death, although 25 mg. before the aeration caused immediate typical symptoms followed by death.

The loss of toxicity of aerated arsphenamin and of the "arsenoxid" is doubtless due to the further oxidation, with the formation of m-amino-p-hydroxyphenylarsonic acid, which is much less toxic than arsphenamin.

A solution of arsphenamin aerated at 56 C. for an hour became slightly less toxic and did not cause oxid symptoms; a portion of the same solution aerated at room temperature for the same period became much more toxic and caused oxid symptoms. In the former case the oxid was apparently further oxidized as it was formed.

It did not seem possible to increase the toxicity of arsphenamin to a point corresponding to its complete conversion into the oxid. The most toxic preparations that I obtained required an amount of the solution corresponding to nearly 60 mg. of arsphenamin per kilogram; this is about the degree of toxicity obtained by Roth in his shaking experiment.

A solution of arsphenamin made toxic by aeration differs from the solutions of at least some toxic preparations of arsphenamin in that when the arsphenamin base is precipitated by neutralization (to litmus) and the solution filtered, the filtrate is toxic and causes the typical "oxid" symptoms. The filtrate may be rendered nontoxic in the same way as the original solution or a solution of the pure oxid itself, that is, by treatment with hydrosulphite or by aeration.

The foregoing methods afford a ready means of determining whether the toxicity of a solution of arsphenamin is due to the "arsenoxid" (or some very similar substance).

When the (acid) solution of arsphenamin was aerated for from two to four hours, there was no increase in the toxicity; Voegtlin and Smith showed that there was little oxidation of arsphenamin under such conditions.

Only two, incidental, experiments were made on the effect of heating the acid solution; in these the dihydrochlorid was dissolved in very hot water and kept in an almost boiling water bath for an hour. In both cases there was a distinct but not marked increase in toxicity; the toxicity was lowered by treatment with sodium hydrosulphite.

TOXIC SUBSTANCES OTHER THAN "ARSENOXID" WHICH MAY BE PRESENT IN ARSPHENAMIN

There were formerly on the market preparations of arsphenamin much more toxic than those found at present; such products are not infrequently obtained in the process of manufacture and prevented from coming into use by the present higher standards of the U. S. Public Health Service [6] and, as has already been stated, the average toxicity of the commercial products in use is greater than that of products that may readily be obtained in the experimental laboratory.[7] This greater toxicity cannot be attributed to the presence of "arsenoxid," and most writers have taken for granted the presence in such samples of small amounts of substances much more toxic than arspenamin itself. This view has not, however, been universally accepted. Thus, the British Salvarsan Committee [8] states: "There is no evidence, indeed, to justify the conclusion that ordinary variations of toxicity, apart from those due to exposure of the substance to air, are due to the presence of impurities more toxic than 606 itself," and then the committee suggests a physical theory of the toxic action of the drug (which will be discussed later). The products considered by this committee to be "good" had, however, a higher toxicity than the preparations now permitted to be sold in this country.

Some of the American investigators have from the first maintained that there is present, in very small amounts, in some samples of arsphenamin a substance or substances much more toxic than arsphenamin itself.[9] All attempts to identify such substances by various refinements of analysis [10] (determination of As: N ratio, etc.) have failed. We have not succeeded

6. The U. S. Public Health Service has gradually raised the requirements as to the tolerated dose for rats from 50 to 100 mg. per kilogram.

7. Schamberg, J. F.; Kolmer, J. A., and Raiziss, G. W. (Am. J. M. Sc. **160**: 188 [Aug.] 1920) found the average tolerated doses of the products of six laboratories to be between 100 and 110 mg. per kilogram of rat, whereas the average tolerated doses of the preparations made in this laboratory by Mr. Christiansen by the method recently described by him (J. Am. Chem. Soc. **42**: 2402, 1920) was between 140 and 150 mg. per kilogram.

8. Reports of the Special Committee upon the Manufacture, Biological Testing and Clinical Administration of Salvarsan and of Its Substitutes, No. 1, Medical Research Committee, Special Report Series, No. 44, 1919.

9. Schamberg, J. F.; Kolmer, J. A., and Raiziss, G. W.: J. Cutan. Dis. **35**: 286 (May-June) 1917.

10. Raiziss, G. W., and Proskouriakoff, A.: The Chemistry of Arsphenamin and Its Relation to Toxicity, Arch. Dermat. & Syph. **2**: 280 (Sept.) 1920.

in identifying a toxic substance or substances, but have been able to exclude some of the possibilities that have been suggested, and have learned something as to the conditions under which toxic products result. Inorganic arsenic compounds have been suggested as the toxic agent; although traces of these have occasionally been found in toxic preparations of arsphenamin which we have tested, the amounts have been far too small to account for the abnormal toxicity. It has also been suggested that the toxicity may be due to sulphur compounds. Arsphenamin made, as is usually the case, by the use of sodium hydrosulphite as the reducing agent, always contains small but variable amounts of sulphur. Ehrlich and Bertheim[11] stated that in the process of reduction, compounds in which sulphur is attached to the arsenic atom are liable to be formed and that these are highly toxic; no details are given as to the nature of these compounds or the degree of their toxicity. The British committee found no correspondence between sulphur content and toxic action. Mr. Christiansen prepared the 3-amino-4-hydroxyphenylarsenous sulphid; the fatal dose of this (intravenous injection into rats) was between 40 and 50 mg. per kilogram. When 6.6 per cent. of a preparation of arsphenamin, which had a tolerated dose of 110, was replaced by this sulphid, the tolerated dose of the mixture was 100 or a little less. Thus, while this sulphid is more toxic than arsphenamin, the presence of even a relatively high percentage would not account for the abnormal toxicity of the class of preparations under discussion.

Furthermore, the symptoms caused by this sulphid are very severe and are very similar to those caused by the corresponding oxid; thus, the mixture containing 6.6 per cent. of the sulphid caused violent symptoms unlike those following any other preparations I have tested with the exception of those containing the "oxid." Thus, the presence of an amount of this sulphid too small to increase greatly the toxicity of a preparation of arsphenamin is easily detected by the symptoms.

The question of whether there are other toxic sulphur compounds which can account for the toxicity of some preparations of arsphenamin is being investigated.

Among other possible contaminations is a polyarsenid of the formula $(C_6H_3NH_2OH)_2As_4$,[12] which has been stated to be more toxic than arsphenamin itself; I have seen no figures to support the last statement, and my own experiments show that rats tolerate doses of 140 mg. per kilogram (intravenous injection); that is, this substance is distinctly less toxic for rats than average samples of arsphenamin.

These toxic arsphenamin preparations differ from those the abnormal toxicity of which is due to the arsenoxid in that the symptoms are different; when the greater part of the arsphenamin is precipitated from the solutions by neutralization the filtrate is not toxic, and the toxicity of the solutions is not lessened by treatment with sodium hydrosulphite. When the solutions were aerated, marked "oxid" symptoms developed, although there was but little increase in toxicity. Warming the solutions for a short time did not diminish the toxicity, as was the case with the class of toxic preparations discussion in the next section.

Until a toxic compound can be isolated and identified it cannot be stated that the toxicity of the class or classes of preparations under consideration is really due to the presence of substances more toxic than arsphenamin itself; but the probability that such is the case is very great.

11. Ehrlich, P., and Bertheim, A.: Ber. d. deutsch. chem. Gesellsch. 44: 1260, 1911.
12. Christiansen, W. G.: J. Am. Chem. Soc. 43: 2402, 1920; 43: 370, 1921.

IS THE TOXICITY OF A SOLUTION OF ARSPHENAMIN INFLUENCED BY ITS PHYSICAL STATE?

Danysz,[13] as a result of experiments which for the most part have not been accepted,[14] attributed many of the reactions of arsphenamin to the precipitation of the latter by certain constituents of the blood. A somewhat similar view was expressed by the Salvarsan Committee of the British Medical Research Committee[15] in these words:

> There is a good deal of evidence in support of the view that the varying toxicity of different samples of "606" is related to small differences in the physical properties of the product, which determine the state of physical dispersion in which the free base comes out of solution when the alkaline solution is injected intravenously.

TABLE 1.—RESULTS OF INJECTIONS IN EXPERIMENT 1*

Time, P. M.	Solution at Room Temperature	Solution at 43 C.	Solution at 60 C.
2:39	80 mg. per kilogram; † 35 min.		
2:45			80 mg. per kilogram; 0
2:56		80 mg. per kilogram; 0	
3:01			80 mg. per kilogram; 0
3:09	80 mg. per kilogram; † 1 hour		
3:23		100 mg. per kilogram; 0	
3:34	80 mg. per kilogram; † 12 min.		
3:42			100 mg. per kilogram; 0

* In the tables, 0 indicates that the rat recovered, and † that the rat died.

What the evidence for this view is, is not very fully stated. An instance is cited, however, in which samples of arsphenamin dissolved in tap-water caused symptoms of vasomotor disturbances whereas, when dissolved in distilled water, no symptoms resulted, while other samples could be dissolved in tap-water with impunity. The authors conclude:

> It would be very difficult to reconcile such an experience with the view that abnormal toxicity depends on the presence of an undue proportion of more toxic by-products.

Recently in working with certain lots of arsphenamin I have observed phenomena which strongly support the idea that the physical condition (colloidal?) of the solution or the presence of a very labile toxic compound may at times account for untoward reactions.

Physicians are usually warned, when making solutions of arsphenamin, not to warm them, since, it is stated, the toxicity is thereby greatly increased. In endeavoring to determine to what extent the toxicity of a solution is increased by different degrees of warming, it was found that in many cases there was not only no increase but a marked decrease in toxicity. Experiments 1, 2 and 3 are typical:

Experiment 1 (R*37).—A 2 per cent. solution of arsphenamin was made alkaline at 2:05 p. m. and divided into three parts; one was kept at room temperature, another at 43 C. and

13. Danysz, J.: Ann. de l'Inst. Pasteur 17: 114, 1917.
14. Shamberg, J. F.; Kolmer, J. A.; Raizisz, G. W., and Weiss, C.: Laboratory and Clinical Studies Bearing on Causes of Reactions Following Intravenous Injections of Arsphenamin and Neo-Arsphenamin, Arch. Dermat. & Syph. 1: 235 (March) 1920.
15. Reports of the Special Committee upon the Manufacture, Biological Testing, and Clinical Administration of Salvarsan and of its Substitutes. No. 1. London, 1919.

the third at 60 C. Intravenous injections into rats were made as recorded in Table 1.

EXPERIMENT 2 (R'33).—A solution of arsphenamin was made alkaline, and one half was warmed to slightly above 40 C. for a few minutes, and then allowed to come to room temperature; the other half remained at room temperature (Table 2).

TABLE 2.—RESULTS OF INJECTIONS IN EXPERIMENT 2

Time, A. M.	Solution at Room Temperature	Warmed Solution
11:34	80 mg. per kilogram; † 8 min.	
11:38	80 mg. per kilogram; † 2½ hours	
11:50	.....	100 mg. per kilogram; 0 (sick)
12:05	.....	80 mg. per kilogram; 0
12:08	80 mg. per kilogram; † 6-15 hours	
2:32	.....	80 mg. per kilogram; 0
2:36	80 mg. per kilogram; † 25 min.	
3:18	80 mg. per kilogram; † 3-15 hours	
3:22	.....	80 mg. per kilogram; 0
	Ice box 42 hours	
9:46	80 mg. per kilogram; 0 (very sick)	
9:51	.....	80 mg. per kilogram; 0
10:30	.....	100 mg. per kilogram; † 55-65 hours
10:35	80 mg. per kilogram; † 8 days (very sick)	
P. M.		
12:23	100 mg. per kilogram; † 10-25 min.	
12:23	.....	100 mg. per kilogram; 0
4:54	.....	120 mg. per kilogram; † 14-25 hours
4:59	.....	120 mg. per kilogram; 0

Thus, warming at 40 C. for a few minutes rendered the solution permanently less toxic. The part of the solution which was not warmed retained its undue toxicity for at least forty-eight hours.

EXPERIMENT 3 (R'41).—A solution of arsphenamin was found to be toxic; a part of it was removed and warmed to 55 C. for fifteen minutes, while the remainder was kept at room temperature (Table 3).

TABLE 3.—RESULTS OF INJECTIONS IN EXPERIMENT 3

Time, P. M.	Solution at Room Temperature	Warmed Solution
12:10	80 mg. per kilogram; 0	
12:19	80 mg. per kilogram; † 15-20 minutes	
1:00	80 mg. per kilogram; † 2-9 minutes	
1:50	.....	100 mg. per kilogram; 0
2:26	80 mg. per kilogram; † 10-13 minutes	
2:40	.....	120 mg. per kilogram; 0
2:50	.....	100 mg. per kilogram; 0
3:17	.....	120 mg. per kilogram; † 1½ hours
5:11	.....	110 mg. per kilogram; 0

Two and a half months later another ampule of this preparation, which had been kept, sealed, at the laboratory temperature, was tested. It caused death at 80 mg. per kilogram; the solution was warmed to 60 C. for fifteen minutes: it caused death at 100 mg. per kilogram (smaller doses were not given). When warmed to 60 C. for one and a half hours it did not cause death in doses up to and including 120 mg. per kilogram (it was not tested at higher doses). This experiment shows that this kind of toxicity is preserved for long periods and also suggests that warming has less effect in diminishing the toxicity after the storage. The original test was made within a day after the preparation was made.

Since warming was found to diminish the toxicity of these preparations, experiments were next made to determine if cold would increase or preserve the toxicity. Accordingly, solutions were kept in ice and injected cold; control experiments were made in which solutions of nontoxic preparations were injected at the same temperature, and it was found that the temperature was not responsible for the differences.

Experiments 4, 5, 6 and 7 are typical of this class:

EXPERIMENT 4 (IV 5).—The acid aqueous solution of a preparation was divided into two portions; one was cooled in ice and then the alkali added; the other portion remained at room temperature and the alkali was added (Table 4).

TABLE 4.—RESULTS OF INJECTIONS IN EXPERIMENT 4

Time, P. M.	Solution at Room Temperature	Cold Solution
2:08	80 mg. per kilogram; 0	
2:17	110 mg. per kilogram; 0	
3:33	.....	80 mg. per kilogram; † at once
3:50	.....	80 mg. per kilogram; † 4-5 minutes
4:44	.....	60 mg. per kilogram; † 6 minutes

Immediately after the first injection of the cold solution a portion was removed and warmed to 38 C. for a few minutes and injected: 100 mg. per kilogram did not cause death. This solution was then placed in ice and when thoroughly cold was injected, still cold, in doses up to and including 110 mg. per kilogram without causing a single death.

EXPERIMENT 5 (IV 11).—The contents of an ampule were divided into two portions; one portion was dissolved in ice-cold distilled water, the other in distilled water at 41 C. Sodium hydroxid was added to each, and the solutions were kept at these temperatures and injected (Table 5).

TABLE 5.—RESULTS OF INJECTIONS IN EXPERIMENT 5

Time	Warmed Solution	Cold Solution
1:40 p. m.	120 mg. per kilogram; 0	
1:51 p. m.	.....	100 mg. per kilogram; † 1-2 minutes
1:56 p. m.	.....	60 mg. per kilogram; very sick; recovered
2:09 p. m.	.....	100 mg. per kilogram; † 10 minutes
2:14 p. m.	130 mg. per kilogram; 0	
	Cylinder in ice	
2:28 p. m.	120 mg. per kilogram; 0	
2:49 p. m.	.....	100 mg. per kilogram; 0
2:55 p. m.	140 mg. per kilogram; 0	
3:46 p. m.	.....	120 mg. per kilogram; 0
3:51 p. m.	150 mg. per kilogram; 0	
4:36 p. m.	.....	130 mg. per kilogram; 0
	Solution warmed to 40 C.	
4:40 p. m.	140 mg. per kilogram; 0	
	Cylinder in ice over night; injected cold	
9:33 a. m.	130 mg. per kilogram; 0	
9:44 a. m.	150 mg. per kilogram; 0	
12:29 p. m.	150 mg. per kilogram; 0	

Thus, the solution of this preparation which had been warmed to 41 C. did not kill a single rat in doses up to and including 150 mg. per kilogram; this was true whether the solution was injected at near the body temperature or near zero.

This experiment also shows that there was a diminution in the toxicity of a solution although it was kept cold.

That this diminution is hastened by warming is shown by Experiment 6.

EXPERIMENT 6.—At 1:58 p. m. (at a time when it was fatal in a dose of 100 mg. per kilogram), part of the cold solution was removed and warmed to 38 C. and injected (Table 6).

TABLE 6.—RESULTS OF INJECTIONS IN EXPERIMENT 6

2: 03	100 mg. per kilogram; 0
2: 20	120 mg. per kilogram; 0

In this experiment the toxicity of the solution diminished on standing, although it was kept cold. This was observed in other experiments also. Thus:

EXPERIMENT 7.—A preparation (IV 1) was dissolved in water, and the cylinder containing the solution was placed in ice; when the solution was cold the alkali was added and injections made (Table 7).

TABLE 7.—RESULTS OF INJECTIONS IN EXPERIMENT 7

Time	
11: 45 a. m.	100 mg. per kilogram; † 2 minutes
11: 52 a. m.	80 mg. per kilogram; † 4-5 minutes
11: 57 a. m.	60 mg. per kilogram; † 13 minutes
12: 02 p. m.	80 mg. per kilogram; † 30-60 minutes
12: 06 p. m.	100 mg. per kilogram; † 2 minutes
1: 09 p. m.	80 mg. per kilogram; 0
1: 50 p. m.	100 mg per kilogram; 0

The solution was then warmed to 40 C. for a few minutes, cooled to room temperature and injected; rats now survived doses of 130 and 140 mg. per kilogram.

Attention may be called to the fact that in the case of the injections of the cold solution in this experiment the solution was kept in ice between the injections and that when 100 mg. per kilogram was injected, 67 per cent. more of the cold solution was injected than when 60 mg. per kilogram was injected; yet the latter caused death, whereas the former, after the solution had stood for two hours, did not. This is another illustration of the fact that the temperature is not the factor causing the greater toxicity of the cold solutions. In fact, rats seem very resistant to the injection of cold solutions—at least when the injection is made at the standard rate used in these experiments, namely, 0.5 c.c. per minute. Mice seemed much more sensitive to the intravenous injections of cold solutions.

Observations were next made of the effect on toxicity of allowing the solutions to stand (in glass-stoppered cylinders) at room temperature; it was found that in some cases there was a diminution of toxicity.[16] There were great differences in this respect with different preparations. In Experiment 2 a preparation, the toxicity of a portion of which was at once diminished by warming to 40 C. for a few minutes, remained toxic for nearly four hours when left at room temperature; and even after standing in the icebox for forty-two hours it was more toxic than a portion of the same solution which had received the same treatment except for the few minutes' warming at 40 C. With other preparations the toxicity diminishes rapidly and the results are like those noticed by the observers quoted. For example, with one preparation (77 b-1) a dose of 110 mg. per kilogram, injected immediately after being made alkaline, caused death, as did also a dose of 130 mg. per kilogram injected twenty-three minutes later; thereafter, in the course of four hours, a number of injections of doses up to and including 150 mg. per kilogram were made without there being a death. The solution was kept at room temperature between the injections. The effect on toxicity of standing (and of warming a solution) was also shown by such experiments as these: one half of a sample (V_1) was dissolved in water at room temperature and made alkaline; the first injection (100 mg. per kilogram) caused death; later injections made at ten-minute intervals did not kill in doses of 120, 130 and 140 mg. The other half of the sample was dissolved in water at 40 C., alkali added and the solution injected at once; the first injection (100 mg. per kilogram) was not followed by death as was the case when the sample dissolved and neutralized at room temperature was injected. Many other illustrations of this phenomenon could be cited.

Whether or not warming the acid solution will diminish the toxicity of this class of preparations has not been definitely determined.

The toxicity which is diminished by warming the alkaline solution is evidently of a different type from those discussed in the first two sections of this paper.

The warming of solutions, the toxicity of which is due to the presence of "arsenoxid," does not diminish the toxicity unless the warming is continued for some time and the solution is aerated (oxidation of the oxid), nor does the warming have any effect on the toxicity of preparations discussed in the second division of this paper.

The cause of this type of toxicity has not been determined, but is being made the subject of further study. The symptoms are very suggestive of those of anaphylactic shock, and it seems probable that an analogous condition is brought about probably by some unusual physical condition of the solution. Treatment, however, in the cold, of rat serum with these toxic solutions did not render the serum toxic, nor did the serum have any effect on the toxicity of the solution. A few experiments were made with a small number of inorganic salts to determine whether they would either diminish the toxicity or prolong it; the results were negative.

There is another, but perhaps less probable, possibility which may be considered: that some compound is present which is easily hydrolyzed by alkali, especially when warmed; this would be analogous to the case of acetyl-cholin or aconitin, the solutions of which when warmed undergo hydrolysis with rapid loss of physiologic activity.

As yet no connection has been found between the process of manufacture and the formation of this type of toxic products; they have resulted from the usual hydrosulphite reduction of m-nitro-p-hydroxyphenylarsonic acid, with the conversion of the base into the hydrochlorid by the methyl alcohol-ether method, and also from the reduction of the m-amino-p-hydroxyphenylarsonic acid[17] and m-amino-p-hydroxyphenylarsenous oxid[18] by hypophosphorous acid (with conversion into the hydrochlorid by precipitation with hydrochloric acid).

That products of this type are found in ordinary commercial preparations is indicated by the observations of Lake, McCoy and Roth noted above.

It is evident that this subject may have considerable importance, both from the standpoint of clinical med-

16. This observation is not new, although so far as I am aware nothing has been published on it. Dr. G. C. Lake, some time ago, remarked that he had noticed that the first one or two rats injected with a given dose of arsphenamin frequently died, whereas those injected later survived; Drs. G. W. McCoy and G. B. Roth stated that the records of the Hygienic Laboratory showed the same thing. My own records of the toxicity tests made on the arsphenamin of the Massachusetts Department of Health did not show such a phenomenon except rarely.

17. Christiansen, W. G. (Footnote 12, first reference).
18. Christiansen, W. G. (Footnote 12, second reference).

icine and from that of laboratory control. Thus, if the testing pharmacologist had such a preparation and added the alkali to a warmed solution or did not inject a solution, made at room temperature, at once after the addition of the alkali or did not make the required number of injections in rapid succession, he would probably overlook the toxic character of the product. If the clinician, on the one hand, had the same preparation and (as he is advised to do) injected the solution immediately after adding the alkali or avoided warming the alkaline solution, there would probably be a severe reaction on the part of the patient. If, however, the injection was delayed a little or if the solution was warm when the alkali was added, there probably would be no reaction. That something of this kind may actually occur is suggested by an incident in which there had been a few complaints by physicians of reactions following the use of certain lots of arsphenamin (some ampules of which showed this type of toxicity in varying degree); but another physician who had used the same lots reported that he had never had a reaction from them. On careful inquiry it was learned that this physician had dissolved the drug in hot water and added the alkali to the solution while it was still warm, ("probably at least 50 C."), the method by which the toxicity of this class of preparations is diminished, but also the method by which the toxicity of the drug is generally supposed to be increased.

This phenomenon may account for some of the cases in which there is apparently a lack of correspondence between the reports of clinicians as to untoward reactions from certain lots of arsphenamin and the laboratory findings as to toxicity; I recall one case in particular in which several clinicians independently and almost simultaneously reported severe reactions from a commercial lot of arsphenamin which, when tested on rats in the laboratory, tested far above the Public Health Service requirements and 50 per cent. higher than another lot which gave rise to no complaints. In this case the manufacturers attributed the reactions to the use by the physicians of too little or too much alkali or to other errors in technic—a rather improbable explanation under the circumstances.

The phenomenon is of interest in another connection: "Idiosyncrasy" has long been supposed to play a rôle in the reaction of some patients to arsphenamin. Thus, it has recently been stated [10] that "undoubtedly, when a number of patients receive arsphenamin of the same lot by the same method of administration and only one or two show reactions, it is safe to assume that they are due to an idiosyncrasy." Obviously, if the one or two showing the reactions were the first to receive the drug, the reactions may have been due to the physical condition of the solution, which spontaneously changed before the injections that were borne without reactions were made.

SUMMARY

The symptoms (in rats) caused by m-amino-p-hydroxyphenylarsenous oxid ("arsenoxid") are very characteristic; the presence in arsphenamin of a percentage of the "oxid" too small to increase greatly the toxicity can readily be detected by the symptoms; confirmatory evidence of the presence of the "oxid" (or of some oxidation product of arsphenamin) in a toxic preparation of arsphenamin is obtained by treating the solution with sodium hydrosulphite: this leads to an immediate diminution of the toxicity if the latter is due to the presence of the "oxid."

No toxic commercial preparations of arsphenamin have been encountered, the toxicity of which could be attributed to the presence of the "oxid."

Some preparations of arsphenamin are very toxic when the solutions are prepared at ordinary room temperature; the toxicity is greatly reduced by gently warming and in some cases by allowing the solutions to stand for a time at room temperature. Cold may preserve the toxicity for long periods. (Preparations which, after warming, may be tolerated in doses of 150 mg. per kilogram may kill in doses of 60 mg. before warming.) It is considered probable that the undue toxicity of such preparations is due to the physical state of the solution, and that this undergoes a rapid change when the solution is warmed.

Toxic preparations of arsphenamin are sometimes encountered, the toxicity of which is due to factors other than the foregoing: the toxicity is not diminished by the action of sodium hydrosulphite or by warming; it is not due to inorganic arsenic and certain other compounds which have been suggested.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

SOLUTION ARSPHENAMINE-LOWY 1 PER CENT.—An aqueous 1 per cent. solution of arsphenamine, possessing the proper degree of alkalinity.

Actions and Uses.—The same as those of arsphenamine (see New and Nonofficial Remedies, 1921, page 41).

Dosage.—Solution arsphenamine-Lowy 1 per cent. is supplied in ampules of 40 Cc. and 60 Cc. These ampules should not be used after the date stamped on the label of each package or if the degree of coloration of the solution is greater than that of a control tube which accompanies the package.

Prepared by the Lowy Laboratory, Inc., Newark, N. J. U. S. patent and trademark applied for. Licensed for interstate sale by the U. S. Treasury Department under the "act to regulate the sale of viruses, serums, toxins and analogous products" as conforming to the regulations for the control, sale and manufacture of arsphenamine, issued June 30, 1919.

Ampoules Solution Arsphenamine-Lowy, 1 Per Cent., 40 Cc.—Each ampule contains solution arsphenamine-Lowy, 1 per cent., 40 Cc. (representing arsphenamine 0.4 Gm.): a sterile needle for intravenous injection and sterile rubber tubing are supplied with each ampule.

Ampoules Solution Arsphenamine-Lowy, 1 Per Cent., 60 Cc.—Each ampule contains solution arsphenamine-Lowy, 1 per cent., 60 Cc. (representing arsphenamine 0.6 Gm.): a sterile needle for intravenous injection and sterile rubber tubing are supplied with each ampule.

Solution arsphenamine-Lowy, 1 per cent., is prepared by dissolving arsphenamine (using the particular brand desired by the purchaser) in fresh, distilled water, carefully neutralizing with sodium hydroxide solution and sealing in ampules under a partial vacuum, the concentration being adjusted so that 50 Cc. of solution represents 0.5 Gm. of arsphenamine.

Solution arsphenamine-Lowy, 1 per cent., is a clear yellow liquid, which, depending on the brand of arsphenamine used, varies from a canary yellow to a greenish yellow.

PITUITARY LIQUID-ARMOUR (See New and Nonofficial Remedies, 1921, p. 222).

The following dosage form has been accepted:

Ampoules Pituitary Liquid-Armour, 0.5 Cc.—Each ampule contains pituitary liquid-Armour 0.5 Cc.

ACRIFLAVINE-ABBOTT (See New and Nonofficial Remedies, 1921, p. 21).

The following dosage form has been accepted:

Tablets Acriflavine-Abbott, 0.03 Gm.—Each tablet contains acriflavine-Abbott 0.03 Gm. (0.46 grain).

Special Article

TYPHOID IN THE LARGE CITIES OF THE UNITED STATES IN 1920

NINTH ANNUAL REPORT

THE JOURNAL presents its ninth annual survey[1] of typhoid fever mortality in the cities of the United States having more than 100,000 population. The statistics of the fourteenth census are now available, and the grouping of cities according to population has been revised to correspond with the latest enumeration.[2]

TABLE 1.—CLASSIFICATION OF CITIES

	Population	Number of Cities
Group 1	More than 500,000	12
Group 2	From 300,000 to 500,000	9
Group 3	From 200,000 to 300,000	12
Group 4	From 150,000 to 200,000	10
Group 5	From 125,000 to 150,000	9
Group 6	From 100,000 to 125,000	16

There are now sixty-eight cities with a population of more than 100,000. These may be conveniently considered for our purpose in six groups (Table 1). More than one fourth of the population of the United States lives in these cities, and nearly one-sixth lives in the cities with more than 500,000 population.

Every one of the twelve largest cities in the country (Group 1) had a typhoid death rate under 10 in 1920, indicating that the remarkable record of 1919 is being maintained. What is still more noteworthy is that

TABLE 2.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 1 (MORE THAN 500,000 POPULATION)

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Chicago	1.1	1.2	2.4	6.2	15.8
Boston	1.5	2.2	2.5	8.0	16.0
New York	2.4	2.5	3.2	8.0	13.5
Los Angeles	2.6	4.7	5.6	10.7	10.0
St. Louis	2.7	5.8	6.5	12.1	14.7
Pittsburgh	2.7	6.2	7.7	15.9	65.0
San Francisco	3.1	3.3	4.6	13.6	27.3
Cleveland	3.2	2.4	4.0	10.0	15.7
Philadelphia	3.3	4.1	4.9	11.2	41.7
Baltimore	4.7	8.9*	11.8	22.7	35.1
Detroit	5.1	5.3	10.6	18.1	21.1
Buffalo	5.1	7.0	8.1	15.4	22.8

while last year ten of the twelve cities had a rate under 5, in 1919 but seven of these cities recorded a rate under 5. In only two instances is the 1920 typhoid rate higher than that for 1919. The most marked declines are reported in Baltimore, Pittsburgh and St. Louis.

The Health Department of New York City continues to publish in its weekly bulletin an admirable summary of its typhoid fever statistics which might well serve as a model for some of the other large cities. It is encouraging to find that in 1920 the percentage of cases in which the probable mode of infection was traced was considerably higher than in 1919. In the third quarter of the year ending September 30, about 27 per cent. of the total typhoid in New York City was attributed to out-of-town infection. A larger proportion of typhoid cases was treated in hospitals than in the preceding year.

Detroit, which for the early part of the decade 1910-1920 lagged behind other Northern cities in typhoid improvement, seems now to have definitely entered the ranks of cities determined to limit typhoid to the utmost. The citizens have approved a twelve million dollar bond issue for a water filtration plant and also have authorized an outlay of twenty-five million dollars to complete sewer extensions which will put an end to the pollution of boundary waters. It takes time to neutralize fully the results of past negligence, but under Detroit's present energetic health administration the city is evidently fairly on its way to obtain a place on the honor roll of American cities.

TABLE 3.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 2 (FROM 300,000 TO 500,000 POPULATION)*

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Newark, N. J.	1.9	2.1	3.3	6.8	14.6
Seattle	1.9	2.3	2.9	5.7	25.2
Milwaukee	2.2	3.5	6.5	13.6	27.0
Minneapolis	2.6	5.1	5.7	10.6	32.1
Cincinnati	3.0	2.6	3.4	7.8	20.1
Indianapolis	3.8	4.7	10.3	20.5	30.4
Washington	6.5	3.7	9.5	17.2	33.7
New Orleans	7.4	13.7	17.5	20.9	35.6
Kansas City, Mo.	7.6	11.2	10.6	16.2	35.6

Buffalo gives an interesting analysis in its sanitary bulletin of the typhoid cases in July, 1920, from which it appears that in all of the twenty cases reported in that month, the infection was contracted outside the city.

For the first time since these annual summaries were begun, the averages for three full five-year periods are available for comparison. In every city in Group 1, a sweeping reduction in typhoid mortality has occurred. In the first quinquennium (1906-1910) all twelve cities had an average typhoid rate over 10; in the second, nine or all but three had a rate over 10, but in the third only two of the twelve had an average rate over 10. In 1919 and 1920 not a single city in the group had a rate as high as 9. The saving of life through the general reduction of typhoid mortality can hardly be dwelt on too often. Pittsburgh, for example, if the average typhoid rate for 1906-1910 had been maintained in 1920, would have lost last year 382 of its citizens from this disease instead of sixteen!

Seven of the nine cities in Group 2 (from 300,000 to 500,000 population) show improvement over the 1919 rate. The increase in the Cincinnati rate is very slight, and the increase in the rate of Washington, D. C.,

1. The preceding articles were published, May 11, 1913, p. 1702; May 9, 1914, p. 1473; April 17, 1915, p. 1322; April 22, 1916, p. 1303; March 17, 1917, p. 845; March 16, 1918, p. 777; April 5, 1919, p. 997, and March 6, 1920, p. 672.

2. The number of typhoid deaths has been sent us by the local officer of health, and the rates have been calculated on the basis of midyear 1920 population estimates made according to the method of the U. S. Census Bureau on the basis of the thirteenth and fourteenth census enumerations. It may perhaps be noted that the figures kindly furnished us by the municipal officials include all typhoid deaths that have occurred within the city limits, nonresidents as well as residents. In some instances this undoubtedly gives an exaggerated impression of the amount of typhoid fever in a community, but at present statisticians are agreed that "the attempt to eliminate the deaths of nonresidents would often result in an understatement of the true mortality" (Bureau of the Census, Mortality Statistics, 1912, p. 13). No attempt has been made to revise the averages of preceding years, since in most cases the figures would be changed but slightly.

is without much significance, since the 1920 figures are compared with a very low rate for 1919, and are below the average for the quinquennium 1916-1920.

New Orleans shows perhaps the most substantial decline of any city in Group 2, and the prospect for a still further reduction is very encouraging. Minneapolis makes an excellent record, in spite of a number of picnic cases supposed to have come from drinking contaminated creek water in a public park. Cincinnati has had trouble from a similar source. The Minneapolis health department has been carrying out an energetic campaign to enforce fully the ordinances governing pasteurization.

Milwaukee continues to maintain a low rate by the sedulous use of water chlorination. For many reasons it seems hardly wise to depend indefinitely on this single barrier between the consumer and a highly and irregularly polluted raw water. A report made during the year by an eminent consulting engineer recommends the installation of a rapid sand filter plant as an additional safeguard.

Kansas City, Mo., brings up the bottom of the list, a circumstance hardly creditable to that municipality in view of the far greater improvement effected in typhoid rates during the last decade by cities less favorably situated. Why should Kansas City have an average typhoid rate for 1919-1920 nearly double that of Washington? During the summer the residents of Kansas City were warned to boil water drawn for drinking purposes from the public supply. There are fortunately now few cities in the United States that periodically have to make this humiliating announcement.

Group 3 (from 200,000 to 300,000 population) again makes an excellent record. Although most of the cities in this group had relatively low death rates in 1919, six

TABLE 4.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 3 (FROM 200,000 TO 300,000 POPULATION)

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Rochester, N. Y.	1.0	3.8	2.9	9.6	12.8
St. Paul	2.1	3.0	3.1	9.2	18.3
Columbus, Ohio	2.5	3.0	7.1	15.8	40.0
Portland, Ore.	3.5	3.6	4.5	10.8	23.2
Akron, Ohio	3.7	8.4	....	....	....
Providence, R. I.	3.8	3.4	4.4	10.2	14.3
Denver	5.0	3.2	5.8	12.0	37.5
Oakland, Calif.	5.5	3.2	3.8	8.7	21.5
Louisville, Ky.	5.5	9.0	9.7	19.7	52.7
Jersey City	6.7	7.2	4.5	7.2	12.6
Toledo, Ohio	7.3	3.1	10.6	21.4	37.5
Atlanta, Ga.	12.8	9.6	14.2	31.4	58.4

of the eleven show a still further reduction in 1920. Rochester, which had the lowest average of the group for the five-year period 1916-1920 (2.9), had the amazingly low rate of 1.0 in 1920. The city of Columbus, Ohio, which from ten to fifteen years ago had an average rate of 40.0, had a rate of only 2.5 last year. Almost without exception the 1920 rates in the cities of this group were lower than the quinquennial average, indicating that the low mark has not yet been reached.

Louisville is worthy of special mention, since it has achieved not only the lowest typhoid rate in its sanitary history, but a rate which compares favorably with that of other cities without Louisville's climatic and racial difficulties. This result has been obtained only by persistent and well-considered endeavors. In that city constant vigilance must be maintained against the use of water from the Ohio River and other polluted sources.

The Louisville Department of Health has had to overcome the familiar opposition to the closing of private wells in thickly settled districts. The coolness and palatability of well water are obvious advantages, but

TABLE 5.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 4 (FROM 150,000 TO 200,000 POPULATION)

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Worcester, Mass.	1.7	2.8	3.5	5.0	11.8
Syracuse, N. Y.	4.0	6.7	7.7	12.3	15.6
New Haven, Conn.	6.1	5.7	6.8	18.2	30.8
Richmond, Va.	6.4	3.7	9.7	15.7	34.0
Dayton, Ohio	7.1	4.5	9.3	14.8	22.5
Omaha	7.8	4.4	5.7	14.9	40.7
Memphis, Tenn.	8.0	58.4	27.7	42.5	35.3
San Antonio, Texas	9.9	9.6	22.3	29.5	....
Dallas, Texas	14.3	12.2	17.2	....	....
Birmingham, Ala.	14.4	14.6	31.5	....	....

hardly sufficient to counterbalance the existence of dangerous contamination. It is just such detailed, painstaking and often difficult work, the closing of polluted wells, the enforcement of sewer connection or of installation of sanitary privies, and the tracking of typhoid carriers, that is steadily cutting down typhoid rates in American cities.

St. Paul again has a very low rate despite a little flare-up of typhoid in the summer, part of which was believed to be due to a carrier in a boarding house. Jersey City seems to have had an unusual prevalence of typhoid, the 1920 rate (6.7) being considerably higher than the recent five-year average (4.5) and almost up to the level of the 1911-1915 average (7.2). This is somewhat surprising for a community with Jersey City's unusually good record during the last fifteen years. No explanation is at hand. Oakland also has a 1920 rate considerably higher than its five-year average. The newcomer in this group—Akron, Ohio—seems to be well in line with the other cities.

Group 4 (from 150,000 to 200,000 population) happens to contain a number of cities in the Southern states where, as is well known, the relatively large negro population and the favorable temperature for fly breeding combine to render typhoid control particularly difficult. Birmingham, however, is putting up a good fight, and in 1920 even reduced slightly its relatively low rate of 1919. It is said that a few years ago there were at least 8,000 insanitary privies in that city, and that most of these have been replaced either by sewerage connections or by sanitary installations.

It will be remembered that in 1919 Memphis suffered from a serious water-borne outbreak of typhoid which raised its typhoid rate for that year to a figure far beyond that of any other large American city. Some one in Memphis evidently felt that an explanation was needed, since brief editorials all couched in identical language under the heading "Memphis Typhoid" appeared in a number of papers in different parts of

the United States. The editorial contained this paragraph:

> In the spring of 1919, after a terrific rainstorm, one of the sewers broke. Before the accident was discovered, two days later, sewage had seeped into one of the wells which supplied the city with artesian drinking water. The city's health department gave warning to the people in the affected districts not to drink the water. Police and sanitary inspectors visited all houses as a further measure of caution. However, many people paid little attention to the warning, although tank wagons with pure water constantly passed through the section. The result was that sixty-seven of Memphis' total of typhoid deaths for the year occurred among these careless people.

It need hardly be pointed out that a warning given two days after such an accident as the one described, although doubtless a desirable precaution, could not be expected to prevent a very high percentage of infection. Chlorinating apparatus for regular treatment of the public water supply has now been installed. A number of privately owned and operated deep wells continue to give some concern to the city authorities. The excellent record made by Memphis in 1920 goes far to bear out the statement in our eighth annual report that Memphis had made good progress in controlling the general typhoid situation, and that, barring the unfortunate accident to its water supply, the city had much of which to be proud. During 1920, special interest was taken in the proper control of the milk supply.

Richmond again bears off the palm for the Southern cities, although the 1921 rate is somewhat higher than that for the preceding year. There are apparently few cities North or South that are as successful as Richmond in getting all, or nearly all, typhoid cases reported to the health authorities. It is thought that the 1920 Richmond typhoid rate was unduly swollen by an unusually high proportion of nonresident deaths, but this is probably true also of some other communities concerning which information is not available.

The Omaha typhoid rate for 1920 was considerably higher than the five-year average. Milk-borne typhoid was believed to be largely responsible.

Worcester, Mass., which has led this group of cities in each five-year period since 1906, makes a new low record and gets a place on the Honor Roll.

TABLE 6.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 5 (FROM 125,000 TO 150,000 POPULATION)

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Bridgeport, Conn.	1.4	3.8	4.8	5.0	10.3
Scranton, Pa.	1.5	1.3	3.8	9.3	31.5
Grand Rapids, Mich.	2.2	5.1	9.1	25.5	29.7
Hartford, Conn.	2.9	0.9	6.0	15.9	19.0
Springfield, Mass.	4.6	2.6	4.4	17.6	....
Youngstown, Ohio	6.7	15.8	....	....	....
Paterson, N. J.	14.7	4.2	6.7	9.1	19.3

Group 5 (from 125,000 to 150,000 population) has two surprises, first the remarkably low rate in Grand Rapids after some years of rather disappointing performance, and, second, a rate in Paterson, N. J. (14.7) which is not only much higher than the 1916-1920 average (6.7), but higher than the average for 1911-1915 (9.1).

Scranton gets a place on the Honor Roll for the second consecutive year. Bridgeport and Hartford also make an excellent showing.

Group 6 (from 100,000 to 125,000 population) contains several cities appearing for the first time on our lists, having overtopped the population limit of 100,000

TABLE 7.—DEATH RATES FROM TYPHOID IN CITIES OF GROUP 6 (FROM 100,000 TO 125,000 POPULATION)

	Deaths from Typhoid per 100,000 Population				
	1920	1919	Average 1916-1920	Average 1911-1915	Average 1906-1910
Yonkers, N. Y.	0.0	1.0	2.2	8.5	10.2
Tacoma, Wash.	1.5	1.6	2.9	10.4	19.0
Lowell, Mass.	2.7	3.4	5.2	10.2	13.9
Cambridge, Mass.	2.7	1.7	2.5	4.0	9.8
Kansas City, Kan.	2.9	7.0	9.4	....	....
Camden, N. J.	3.4	2.7	4.9	4.5	....
Norfolk, Va.	3.4	....	....	....	....
Albany, N. Y.	3.5	7.6	8.0	18.6	17.4
Fall River, Mass.	5.0	3.0	8.5	13.4	12.5
Reading, Pa.	5.6	6.1	10.0	31.9	47.0
Salt Lake City	5.9	5.4	9.3	16.2	....
Spokane, Wash.	6.7	0.0	4.9	17.1	50.3
Trenton, N. J.	8.3	6.8	8.6	22.3	....
Nashville, Tenn.	9.3	15.8	20.7	40.2	61.2
New Bedford, Mass.	10.6	1.6	6.0	15.0	16.1

TABLE 8.—DEATH RATES FROM TYPHOID IN 1920

Honor Roll (from 0.0 to 2.0)			
Yonkers, N. Y.	0.0	Scranton, Pa.	1.5
Rochester, N. Y.	1.0	Tacoma, Wash.	1.5
Chicago	1.1	Worcester, Mass.	1.7
Bridgeport, Conn.	1.4	Newark, N. J.	1.9
Boston	1.5	Seattle	1.9
First Rank (from 2.0 to 5.0)			
St. Paul	2.1	Cleveland	3.2
Milwaukee	2.2	Philadelphia	3.3
Grand Rapids, Mich.	2.2	Camden, N. J.	3.4
New York	2.4	Norfolk, Va.	3.4
Columbus, Ohio	2.5	Albany, N. Y.	3.5
Los Angeles	2.6	Portland, Ore.	3.5
Minneapolis	2.6	Akron, Ohio	3.7
St. Louis	2.7	Providence, R. I.	3.8
Pittsburgh	2.7	Indianapolis	3.8
Lowell, Mass.	2.7	Syracuse, N. Y.	4.0
Cambridge, Mass.	2.7	Springfield, Mass.	4.6
Hartford, Conn.	2.9	Baltimore	4.7
Kansas City, Kan.	2.9	Denver	5.0
Cincinnati	3.0	Fall River, Mass.	5.0
San Francisco	3.1		
Second Rank (from 5.0 to 10.0)			
Detroit	5.1	Spokane, Wash.	6.7
Buffalo	5.1	Dayton, Ohio	7.1
Louisville, Ky.	5.5	Toledo, Ohio	7.3
Oakland, Calif.	5.5	New Orleans	7.4
Reading, Pa.	5.6	Kansas City, Mo.	7.6
Salt Lake City	5.9	Omaha	7.8
New Haven, Conn.	6.1	Memphis, Tenn.	7.9
Richmond, Va.	6.4	Trenton, N. J.	8.3
Washington	6.5	Nashville, Tenn.	9.3
Youngstown, Ohio	6.7	San Antonio, Texas	9.9
Jersey City	6.7		
Third Rank (from 10.0 to 20.0)			
New Bedford, Mass.	10.6	Birmingham, Ala.	14.4
Atlanta, Ga.	12.8	Paterson, N. J.	14.7
Dallas, Texas	14.3		

in the fourteenth census. Yonkers, N. Y., which is just over the line (population, Jan. 1, 1920, 100,226) makes a conspicuous début by reporting no single death from typhoid in the calendar year, thus emulating Spokane's record of 1919. Yonkers seems to have had a good typhoid record since 1906.

Norfolk, Va., has the low rate of 3.4, as contrasted with the very high rate of 53.9 in 1910. Spokane seems to have had a number of cases due to infection contracted at a summer resort. Albany, N. Y., is reported

to have had a February outbreak of gastro-intestinal disease attributed to the water supply. This was not followed, however, by any marked increase of typhoid. The contamination of the water was supposed to be caused by the use of an inadequate amount of coagulant owing to shortage on account of transportation difficulties. If one must drink diluted sewage it is fortunate, indeed, if there are few typhoid bacilli in the sewage.

The rates for this group of cities are now so low for the most part that there is little use in instituting detailed comparisons of rates for a single year. It is obviously largely a matter of chance whether there are two or five typhoid deaths in a population of approximately 100,000, and no sanitary significance is likely to attach to such fluctuations. Special attention, however, must be drawn to the admirable record of Nashville. There is a great difference between a rate of 61 (average 1906-1910) and a rate of 9 (1920). The steady improvement in the typhoid situation in Nashville is one of the outstanding facts in our record of the last nine years. Few cities have made such progress in the face of great difficulties. Even Richmond did not start at as low a level in its 1906-1910 average.

New Bedford drops from the Honor Roll to a city of the third rank. Some special source of typhoid was evidently tapped in that city in 1920.

In reviewing the whole record for 1920, it appears that typhoid is still decreasing in the large cities of this country at a rapid rate. Tables 9 and 10 show plainly

TABLE 9.—AVERAGE DEATHS FROM TYPHOID PER HUNDRED THOUSAND IN EACH GROUP, 1916, 1917, 1918, 1919 and 1920

Group	Year	No. of Cities	Total Population	No. of Typhoid Deaths	Av. Deaths per 100,000
1	1916	9	13,743,746	854	6.2
1	1917	9	14,057,263	774	5.5
1	1918	9	13,809,991	598	4.3
1	1919	9	15,019,516	463	3.1
1	1920	12	16,585,740	469	2.8
2	1916	10	4,053,281	344	8.5
2	1917	10	4,150,000	329	7.9
2	1918	10	4,372,088	298	6.8
2	1919	10	4,511,181	204	4.5
2	1920	9	3,463,760	141	4.1
3	1916	10	2,635,983	248	9.4
3	1917	10	2,701,029	173	6.4
3	1918	10	2,773,716	193	6.9
3	1919	10	2,829,092	134	4.7
3	1920	12	2,951,373	142	4.8
4	1916	14	2,250,991	330	14.7
4	1917	14	2,310,372	307	13.3
4	1918	14	2,449,736	331	13.5
4	1919	14	2,564,990	210	8.2
4	1920	10	1,707,624	135	7.9
5	1916	17	1,983,918	235	11.8
5	1917	17	2,031,313	229	11.3
5	1918	17	2,053,215	240	11.7
5	1919	17	2,106,710	115	5.5
5	1920	7	992,436	46	4.8
6	1920	15	1,718,168	83	4.8
Total....	1916	60	25,667,919	2,011	8.1
Total....	1917	60	25,230,076	1,812	7.2
Total....	1918	60	25,458,656	1,660	6.5
Total....	1919	60	27,028,359	1,126	4.2
Total....	1920	65	27,330,099	1,007	3.7

what has occurred. Every group of cities has shared in the decline; and while the rates in the larger cities have been somewhat less than in cities below 200,000 population, the differences seem due to geographic location rather than to size. There are fifty-four cities for which averages for these full five-year periods are now available.

In our last summary the striking drop in typhoid occurring between 1918 and 1919 (Table 7) was ascribed in large part to the typhoid immunization practiced in the army camps in 1917-1918. Additional facts are now at hand to bear out this belief. In a number of localities it has been found that whereas

TABLE 10.—TOTAL AVERAGE TYPHOID DEATH RATE (1910-1920)

	Total Population (57 Cities)* Estimated by U. S. Census Bureau Methods	Typhoid Deaths	Typhoid Death Rate per 100 000
1910	20,986,025	4,114	19.59
1911	21,545,014	3,391	15.74
1912	22,093,993	2,775	12.56
1913	22,642,972	2,892	12.77
1914	23,191,951	2,408	10.38
1915	23,740,930	2,068	8.71
1916	24,395,359	1,842	7.61
1917	24,740,068	1,647	6.65
1918	24,971,278	1,557	6.22
1919	25,586,186	987	3.87
1920	26,154,013	921	3.52

* Eleven cities are omitted from this summary because data for the full period are not available.

TABLE 11.—NUMBER OF CITIES WITH RATES ABOVE 20 AND BELOW 10

	Number of Cities with Average Typhoid Rates Above 20	Number of Cities with Average Typhoid Rates Below 10
1906-1910	31	1
1911-1915	9	16
1916-1920	2	44

before 1919 the male typhoid rate in the age-group 20-30 was somewhat higher than the female, this relation was reversed in 1919 and the female typhoid rate was much higher than—in some cases more than double—that of the male rate for the corresponding years. It is especially interesting to note that the vaccination immunity persisted to a considerable degree in 1920 and, so far as specific data are at hand, showed no signs of wearing off. The general typhoid death rate seems to corroborate this inference, since the 1920 rate fell below that of 1919 in about the same ratio as that of 1918 fell below that of 1917. At all events, the 1920 rate gives no indication that the men inoculated against typhoid in 1917 and 1918 had in any large proportion lost their immunity in 1920.

In going over the reports and discussion of typhoid in various cities, one is impressed with the relative frequency of small outbreaks—sometimes hardly half a dozen cases—attributable to drinking the contaminated water of rivers, small streams or springs in public parks or recreation grounds. Oftentimes the water drunk at a "picnic party" is from a source so obviously and so badly contaminated that only the very young or very ignorant would think of using it. In addition to the precaution of making such sources as difficult of access as possible, it would seem that educational influence must be largely relied on to prevent this mode of infection.

A comparison of the Honor Roll (typhoid death-rate from 0.0 to 2.0) for 1920 with that for 1919 shows that the number of cities with the lowest rate has increased from eight to ten. Three cities, Chicago, Scranton, Pa., and Tacoma, Wash., are on the Honor Roll in both years. Cambridge, Mass., has the distinction of making the best record of any American city for the whole fifteen-year period.

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SATURDAY, MARCH 26, 1921

COORDINATION IN PUBLIC HEALTH WORK

The movement for better health conditions is now about twenty years old. Beginning with discussion and agitation on specific questions, followed by the organization of a large number of separate societies, it has now reached the stage where the need of coordination and cooperation has become urgent. A number of striking illustrations of this tendency have been seen recently. The various organizations interested in child welfare have formed a federation known as the National Child Hygiene Council, for the purpose of coordinating their work and eliminating duplication, including the American Child Hygiene Association, the American Red Cross, the Child Hygiene Organization of America, the National Child Labor Commission, the National Organization for Public Health Nursing and the National Tuberculosis Association. The council announces as its ultimate goal the development of a comprehensive and well planned child health program on a national scale. It also plans for a community demonstration of what such a program should be.

Another centralizing movement is the organization of the Eye Sight Conservation Council, already noted in our news columns.[1] This council has for its objects the conservation and improvement of vision by arousing public interest in eye hygiene and defective vision, and the protection of the eyes in hazardous occupations.

The same tendency toward coordination and cooperation is found in the Women's Foundation for Health, made up of the representatives of fourteen national women's organizations, among which are the General Federation of Women's Clubs, the Women's Christian Temperance Union, the Young Women's Christian Association, the National Association of Collegiate Alumnae, the Congress of Mothers' and Parent-Teachers' Associations, and others. This body is organized for the attainment of health rather than for the prevention of disease, a most significant and constructive distinction.

Another example of this synthetic tendency is the American Conference on Hospital Service, made up of representatives of twelve national organizations, including the three governmental medical services, the American Hospital Association, the American College of Surgeons, the Catholic Hospital Association, the National Association for Public Health Nursing, and the American Medical Association. This body has established a library and service bureau, and plans to hold annual conferences on hospital management and standardization.

Last, and perhaps most important in its possibilities, is the National Health Council, recently organized as the result of seven years of agitation and discussion. This body is made up of representatives of the American Public Health Association, American Red Cross, American Social Hygiene Association, the Conference of State Health Officers, the National Child Hygiene Council, National Committee for Mental Hygiene, National Organization for Public Health Nursing, National Tuberculosis Association, and the Council on Health and Public Instruction of the American Medical Association. It is intended as a clearing house and coordinating center for constructive organization as well as for the formulation of a uniform policy in the public health field, the development of economy and effectiveness, and the elimination of duplication and confusion in public health work.

It has been obvious for many years that organization in public health has been carried to an absurd point, and that efficiency in administration and effectiveness in public appeal have been largely impaired thereby. It is natural that in a field so large and of such recent development there should be, for the time being, overorganization and duplication of superfluous activities. The pendulum is now swinging in the opposite direction. There is a strong tendency toward cooperation and combination as a substitute for division and rivalry. What the future may bring in the organization of the public for health purposes it is difficult to predict; but the present tendency toward mutual understanding and cooperation is both encouraging and desirable.

1. **Conservation of Vision, General News, J. A. M. A. 76:600 (Feb. 26) 1921.**

ARE THERE MORE STRAINS THAN ONE OF SPIROCHAETA PALLIDA?

In 1894, Fournier[1] introduced the concept "parasyphilis," and his investigations and deductions, with those of Erb, have been considered as important contributions confirming the causal relation of syphilis to paresis and tabes. Although the term "parasyphilis" has fallen into disrepute, the definite linking of *Spirochaeta pallida* with the two diseases provided a large field for experimentation and speculation. Thus, the questions whether neurosyphilis is to be considered as a manifestation of a disease more commonly associated with lesions of other structures, or whether there are more strains than one of the spirochete, have attracted

1. Fournier: Les affections parasyphilitiques, Paris, 1894.

the attention of many scientists. What Fournier demonstrated by clinical methods Noguchi afterward confirmed by recovering the spirochete from the brain, subarachnoid fluid and blood of general paralytics.

After the establishment of the syphilitic origin of paresis and tabes, it was natural that the relative frequency of their occurrence in the history of the disease should be subject to scrutiny by syphilographers, and that investigation should be undertaken to account for the wide divergence in symptoms of a disease attributable to a common causative agent. In 1893, Morel-Lavalée [2] quoted the now well known case of the girl Marthe X, who in 1870 and 1871 infected five successive lovers with syphilis, each one of them succumbing later to paresis. While this series may have had the significance of *post hoc* rather than *propter hoc*, it stimulated investigation to determine whether the exciting cause of syphilis in its many forms was a single organism or whether there were diverse strains of the responsible spirochete.

Up to the present, nothing absolutely definite has come out of these researches. In 1914, Nichols [3] reported the results of a series of experiments relative to the localizing power of *Spirochaeta pallida* and suggested that there were more strains than one of the organism. The same author [4] later reported on experiments made with a strain of *Spirochaeta pallida* recovered from a patient with neurosyphilis, and in this report suggested the existence of different strains with varying invasive power and with individual characteristics. He cited the three forms of the spirochete classified by Noguchi, the thick, thin and medium, and stated that the one with which he worked belonged to the first type. "The question of the variation of strains of a pathogenic micro-organism is a complicated one," he says, "and calls for a consideration of variations in the host as well as in the parasite itself." In 1916, Reasoner [5] reviewed the work of Neisser, Uhlenhuth and Mulzer, Steiner, Weygandt and Jacob, Noguchi and Nichols, and Wile, Zinsser and Hopkins, and further elaborated that done with a strain isolated by Nichols and Hough from a "neurorecidiv." From a number of experiments on rabbits, he concluded that it is possible to demonstrate satisfactorily fixed differences in various strains of syphilis as found in the rabbit; that it is possible to produce nervous involvement in the rabbit without actual intracranial inoculation; that no morphologic differences in the various strains were discovered, and that granting that there are different strains or types of syphilis differing in invasiveness or predilection for certain tissues, the individual resistance of the infected person must still be considered as a factor in the development of the disease.

Of the work undertaken on the continent along this line, that of Levaditi and Marie [6] attracted wide attention. Their studies began in 1914, and were first reported on in 1919. Both are strongly of the opinion that there are two independent strains of *Spirochaeta pallida*, one of which they term the dermotropic and the other the neurotropic, in accordance with their selective action on body structures. In two instances, through accidental inoculation of investigators, they had opportunity to observe results in the human species. Among the significant facts brought out were the different selective affinity for the two so-called strains: the difference in the periods of incubation and, what seems particularly significant, the fact that an animal infected with one strain, while immune to subsequent inoculation with the same virus, has no acquired immunity to infection by the other strain. While they admit the possibility of the evolution of a special strain from a common source, by propagation in the nervous centers, they suggest that this evolution may give rise to a really new strain and that this strain may persist like a mendelian variant as such in place of reverting to its former characteristics; that a developed neurotropic spirochete will thereafter function as such rather than lapse again into a form which may embrace dermotropic attributes. As academic support of their theory, they cite the fact that immunity to any one of the relapsing fevers, African, European or American, does not safeguard the patient from an infection against the others, in spite of the morphologic resemblance of the spirilla and the similarity of the course of the disease which they produce. More recently, Pagniez [7] reviewed this report, and remarks that we are coming more and more to the belief in the existence of different strains in the same micro-organisms, as evidenced by the tendency toward the use of polyvalent serums. To him virulence of the organism seems to be the important factor, and he concludes that syphilis cannot long claim exemption to this law, and that even at the present time one would not be far wrong in differentiating strains in the virus of the disease.

Finally, Laumonier [8] does not agree with Levaditi and Marie. He is inclined to believe that there is a difference in the host rather than in the organism itself, and that the variance in results may be accounted for on this ground rather than by any divergence in the strains of the spirochete itself. This side of the question is, of course, equally entitled to consideration. It is fundamental to the science of bacteriology to consider in any infection the virulence of the infecting organism and the resistance of the host. Further investigations of the various phases of syphilitic infection

2. Morel-Lavalée: Paralysie générale et syphilis, Rev. de méd. **13**: 137-154, 1893.
3. Nichols, H. J.: Observations on the Pathology of Syphilis, J. A. M. A. **63**: 466 (Aug. 8) 1914.
4. Nichols, H. J.: J. Exper. Med. **19**: 362, 1914.
5. Reasoner, M. A.: Some Phases of Experimental Syphilis, J. A. M. A. **67**: 1799 (Dec. 16) 1916.
6. Levaditi, C., and Marie, A.: Etude sur le treponème de la paralysie générale, Bulletin de l'Inst. Pasteur, November, 1919, p. 741.
7. Pagniez, P.: De la pluralité des germes syphilitiques, Presse méd. **28**: 266 (May 1) 1920.
8. Laumonier: Y-a-t-il plusieurs syphilis? Gaz. d. hôp., Aug. 19 and 20, 1920, p. 1127.

may possibly bring to light facts which will tend materially to betterment of our knowledge of etiology of syphilitic manifestations and corresponding improvements in therapy.

THE EPINEPHRIN TEST IN RELATION TO THE THYROID GLAND

The possible functional interrelationships of various endocrine organ systems in health and disease have become a popular subject for speculation in the last few years. Some of the "tests" now applied in the clinical diagnosis of disordered function of ductless glands are based on assumed interactivities of the sort just referred to. The Goetsch test may be classed in this category. The development of useful methods for the study of the respiratory exchange has made it possible to add facts regarding the metabolism, even in man, to those more easily acquired data respecting pulse rate, blood pressure and body temperature. Any one who will take pains to examine what has been written in regard to this subject will soon be apprised of the contradictions and confusion in the assertions of a rapidly growing number of writers in a field in which accurate observation and clear thinking have been all too rare.

Not long ago, Sandiford [1] of the Mayo Foundation reported the effect of the subcutaneous injection of epinephrin on the metabolic rate, pulse rate and blood pressure of patients suffering from various disorders of the ductless glands. She concluded that doses of 0.5 c.c. of a 1:1,000 solution of epinephrin chlorid invariably cause an increase in the metabolic rate. This increase is usually accompanied by an increase in the ventilation rate, respiration rate, number of heart beats each minute, volume of each beat, greater utilization of the blood carrying power and peripheral dilatation, with an increased systolic and decreased diastolic blood pressure. In these tests no relationship was found between the intensity of the reaction and the degree of hyperthyroidism or hypothyroidism. Consequently, Sandiford concludes that there is no sound physiologic foundation for the assumption that the character of the reaction following such injections of epinephrin is indicative of the activity of the thyroid gland.

Marine and Lenhart [2] of Western Reserve University Medical School have confirmed these findings in experiments on animals. By comparison of the effects of the subcutaneous injection of epinephrin in both normal and thyroidectomized rabbits—also in the same animal before and after thyroidectomy—it was found that a rise in oxygen consumption occurs in every case. There is evidence, however, that in general the onset of the rise in oxygen consumption following administration of epinephrin is delayed in thyroidectomized animals, and also that it does not last so long. Nevertheless, the metabolism is unquestionably increased by the suprarenal hormone even when no thyroids are present.

One naturally speculates as to the cause of the altered metabolism under the conditions cited, in which the increase in the rate of cellular combustion may vary between values of 4 and 48 per cent. in terms of calorific increase. Previous writers [3] have pointed out the similarity between the increment in metabolic rate after the injection of small doses of epinephrin and that found by Lusk to attend a carbohydrate plethora. This suggests that the epinephrin effects likewise may be due to the liberation of considerable quantities of carbohydrate products in the body as the outcome of the administration of the hormone. In any event, the failure of several competent investigators to discover a strict parallelism between the changes in blood pressures and pulse rate and the degree of hyperthyroidism throws into question the diagnostic value of the epinephrin reaction [3] in such conditions.

1. Sandiford, Irene: The Effect of the Subcutaneous Injection of Adrenalin Chlorid on the Heat Production, Blood Pressure and Pulse Rate in Man, Am. J. Physiol. **51**: 407 (April) 1920.
2. Marine, David, and Lenhart, C. H.: The Influence of Glands with Internal Secretions on the Respiratory Exchange, I, Effect of the Subcutaneous Injection of Adrenalin on Normal and Thyroidectomized Rabbits, Am. J. Physiol. **54**: 248 (Dec.) 1920.
3. Goetsch, E.: New York State M. J. **18**: 259 (July) 1918.
4. Handbook of Therapy, Chicago, American Medical Association, 1920, p. 191.

Current Comment

THE SOURCE OF TUBERCULOSIS IN CHILDHOOD

Sir Clifford Allbutt remarked a few years ago at a session of one of the sections of the British Medical Association devoted to tuberculosis: "Probably most of us here have had tuberculosis and recovered from it." This epitomizes the widespread current belief that tuberculous infection is a common fate of childhood and that the seeming freedom from the disease in later years is due to the successful resistance of the human organism to the development and spread of the lesions acquired so commonly in the early periods of life. A recent writer [4] has frankly remarked, in reference to the bacillus of tuberculosis, that a germ which is so constantly present in almost every community of civilized peoples must be breathed and swallowed by most persons. This statement is intended to emphasize the belief that these bacilli gain entrance to the system essentially by way of the respiratory and the alimentary tracts, respectively. The question as to the relative significance of these two ever open pathways of infection is one of considerable importance, for on the answer depends in some measure the direction in which early prophylaxis against tuberculosis can most effectively be pursued. Effort must, of course, be concentrated on the maintenance of effective immunity factors, in any event. The building up of a potent resistance by the promotion of good health is a prime requisite. But if the fight is to be carried outside the already invaded human organism into its environment, shall it be directed more vigorously against food or

against air? THE JOURNAL has no desire to enter the field as a protagonist, yet it recognizes the propriety of presenting the latest evidence from time to time. In this spirit, reference is made to the outcome of an elaborate series of necropsies at the Babies' Hospital in New York by Wollstein and Spence.[5] Although, as was expected, they show the great frequency of tuberculosis in infancy and early childhood, there is suggestive evidence of a decline of tuberculosis among young children admitted to this institution during the last six years. The findings indicate the greater incidence of tuberculosis of infants and young children acquired by inspiring tubercle bacilli compared with that acquired by swallowing the bacilli with milk or food. In only five out of 184 necropsies showing tuberculous invasion were the lungs not involved, and in only seven were the bronchial glands not the seat of tuberculous lesions. In the light of such facts the respiratory factor in the genesis of tuberculosis cannot be minimized.

URINE SUGAR IN INFANCY

With refinement of the methods of testing for sugars it has become clear that the normal urine is not always absolutely free from these carbohydrates. It is true that such familiar tests as the reaction with Fehling's solution fail to give a positive indication when applied to samples of urine obtained during health. On the other hand, more delicate reactions unquestionably give a positive response indicating that even the normal human kidney is not a perfect barrier against the escape of sugar from the blood in which it is continually circulating. The quantity of sugar that thus finds its way into the urine may be less than a gram per day and consequently fails to be detected; but a sufficiently sensitive test tells the story. Consequently, Stanley Benedict has proposed to designate an unusual excretion of sugar by the term glycuresis rather than glycosuria, which latter seems to be an almost never-failing phenomenon. As the sugar content of the blood fluctuates to a certain extent in relation to the amount of carbohydrate ingested, it has long seemed reasonable to associate so-called postprandial glycosuria with postprandial hyperglycemia. The conclusion respecting the percentage of blood sugar above which the glycosuria occurs has depended on the refinement of the analytic methods used in the estimation of the carbohydrate in the blood and urine, respectively, as well as on the functional state of the kidneys concerned. These general considerations have lately been further substantiated by Greenthal [6] of the Department of Pediatrics at the Cornell University Medical College, who likewise comes to the conclusion, after employing the methods of Benedict, that the urine of all normal infants contains a determinable amount of reducing sugar. The amount of sugar excreted is not dependent on the volume of urine but is directly proportional to the amount of sugar ingested. As the amount of sugar in the diet is increased, the total urine sugar increases. This increase is chiefly in the fermentable portion and, as a result, the percentage of nonfermentable sugar becomes less. In infants, excretion of sugar, both fermentable and nonfermentable, is fairly constant when the intake of sugar is constant. If these positive findings contradict some of the earlier statements of pediatricians in regard to the carbohydrate problems of infancy, they must be attributed to the advent of more adequate methods. It also is apparent that, in estimating sugar tolerance, careful quantitative determinations of the urine sugar offer the best basis for decision.

5. Wollstein, Martha, and Spence, R. C.: A Study of Tuberculosis in Infants and Young Children, Am. J. Dis. Child. **21**: 48 (Jan.) 1921.
6. Greenthal, R. M.: A Study of the Urine Sugar in Infants, Am. J. Dis. Child. **20**: 556 (Dec.) 1920.

MANGANESE AS A POISON

The toxicology of manganese has until recently been little understood. Used therapeutically as potassium permanganate essentially for external application, the element has not been a cause of poisoning, nor have the small quantities that occasionally find internal use in man presented toxicologic problems. Industrial workers are sometimes exposed to the dusts of ores containing considerable admixtures of manganese compounds. This is particularly true in zinc mines, where the oxids of manganese, iron and zinc occur together. Some ores also have a high content of manganese as a silicate. As the sources of menace are insoluble dusts, the chief portals of entry into the body must be the alimentary canal and the respiratory tract.[1] The latter is commonly borne in mind as a path of invasion when matter in particulate form is concerned. The possible effects of coal dust on the lungs of the miner and of quarry dust on those of the stone cutter are widely appreciated by those who deal with industrial menaces. Less consideration is usually given to the equally potent danger from swallowed dusts. In the case of the latter the risk depends primarily on their solubility in the alimentary secretions. Investigations of Reiman and Minot [2] in the Laboratory of Applied Physiology at the Harvard Medical School demonstrate that ores containing manganese as oxids and silicates are soluble in gastric juice. Manganese is absorbed in the blood stream, causing in most cases a slight temporary rise in manganese concentration followed by a quick return to normal. In none of the cases studied was the manganese content of the blood increased by the ingestion of manganese ores to a value of more than double the normal level, and in some of the subjects no increase was noted. Even prolonged feeding of large amounts of manganese ore to dogs failed to produce significant changes in manganese content of the blood and tissues or to cause any pathologic symptoms. Manganese ores are thus nontoxic, and in order to produce symptoms of poisoning must be ingested by persons who are peculiarly susceptible. This doubtless serves to explain the comparative rarity of cases of severe intoxication caused by this element in clinical experience. Incidentally, it may be noted that manganese is far more widely distributed in traces in nature than is commonly supposed, so that it has even been rated by some as being among the essential components of living matter.

1. Edsall, D. L.; Wilbur, E. P., and Drinker, C. K.: J. Indust. Hyg. **1**: 183 (Aug.) 1919.
2. Reiman, C. K., and Minot, A. S.: Absorption and Elimination of Manganese Ingested as Oxides and Silicates, J. Biol. Chem. **45**: 133 (Dec.) 1920.

Association News

THE BOSTON SESSION

Clinics Preceding the Scientific Assembly

The Local Committee on Arrangements announces that among other features which are being provided for the entertainment and instruction of the Fellows who attend the annual session will be a series of clinics in the Boston hospitals, June 6 and 7. The hospitals participating are the Boston City Hospital, the Boston Lying-in Hospital, Carney Hospital, the Children's Hospital, the Eye and Ear Infirmary, the Free Hospital for Women, the Floating Hospital, the Forsyth Dental Infirmary, the Good Samaritan Hospital, the Huntington Memorial Hospital, the Infant's Hospital, the Massachusetts General Hospital, the New England Hospital for Women and Children, the Peter Bent Brigham Hospital, the Parker Hill Hospital (Public Health Hospital) and the St. Elizabeth Hospital. In addition, the Angell Memorial Animal Hospital will be open for inspection during the days of the annual session. These arrangements will make available to visiting physicians the clinical facilities of the medical center in which the annual session is to be held. In addition to the clinics, Fellows are invited to visit the open air classes conducted in connection with the Boston public schools.

Medical Historical Exhibit at the Boston Public Library

In the room used for exhibits on the floor of the special libraries at the Boston Public Library, there will be an exhibit of early texts (Hippocrates to Sydenham) dealing with fevers and with specific infections. These will be arranged in chronological order. In addition to the texts, there will be considerable illustrative material touching on hospitalization and treatment, the use of baths, venesection, new remedies, pest banners, broadsides and medals, also Saint Roch and Saint Sebastian, and various aspects of the plague and syphilis dealt with in the graphic arts. General texts illustrating the Greek, Byzantine, Mohammedan and medieval practice in fevers will occupy half of the space allotted. The other half will contain tracts on the plague and syphilis, original descriptions, new diseases and primary treatises on the doctrine of contagium vivum. A descriptive catalogue will be ready for distribution at the time of the annual session.

ANNUAL CONFERENCE ON MEDICAL EDUCATION AND HOSPITALS, LICENSURE AND PUBLIC HEALTH

Held in Chicago, March 7-10, 1921

MEDICAL EDUCATION AND HOSPITALS

(Continued from page 801)

TRIAL REPORT OF THE COMMITTEE ON GRADUATE INSTRUCTION IN PHYSIOLOGY

DR. JOSEPH ERLANGER, St. Louis: The course of training of candidates for a career in physiology may be divided into (I) collegiate training and (II) professional training, the latter term being used in a broad sense to include work done toward the Ph.D. degree as well as toward the M.D. degree, since in either case the candidate is preparing himself for a profession.

I. Collegiate. (a) Minimal. Two years of college work, including physics, chemistry (through organic) and biology. (b) Maximal. A full college course, including the usual liberal training, the subjects mentioned under I a, German and French, and courses leading through calculus, advanced physics and physical chemistry. II. Professional. 1. In the graduate school (the departments of a university medical school are regarded as departments of the graduate school). (a) Minimal. Requirements for the Ph.D. degree with physiology as major. (b) Maximal. Same as under II, 1 a, but minors to include courses advancing the training in some one or two of the cognate subjects mentioned under I b. 2. In the medical school. (a) Minimal. Four year medical course. (b) Maximal. Four year medical course with ample time for electives, which should include some of the subjects mentioned under I b and II 1 b, in which the student may happen to be deficient, investigation in physiology and physiologic journal club.

An internship is not regarded as essential; but if a fifth year should be required for graduation or medical licensure, then those intending to go into physiology should be allowed to devote that year to laboratory work. In order to satisfy legal requirements and still leave the way open to a scientific career, provision might be made for interns in physiology whose function would be to do for physiology what pathologic interns now do for pathology.

The training as tabulated above should suffice to prepare the student for an assistantship in a physiologic department where, under the apprenticeship of a competent physiologist, with the preparation of demonstrations, practice in teaching, participation in a journal club, and, especially, research as his duties, the candidate, should be given an opportunity to demonstrate his worth.

The problem confronting physiology and certain other of the preclinical sciences differs from the general problem to be solved by the Committees on Graduate Medical Instruction in that the physiologist can practice his profession in a university only, whereas relatively few clinicians expect to devote themselves to university work.

GRADUATE INSTRUCTION IN PHARMACOLOGY

DR. CHARLES W. EDMUNDS, Ann Arbor, Mich.: There are three groups of men for whom graduate instruction in pharmacology has to be provided: Those who expect to become pharmacologists; those who enter pharmacology, but who later may go into internal medicine, and finally, those who are preparing for one of the medical or surgical specialties, and who desire some work in this subject as a part of their graduate training.

The relation between pharmacology and internal medicine is so intimate that graduate courses in pharmacology for those who plan ultimately to go into internal medicine require separate discussion. Provision should be made for two types of students. The first of these is the graduate student whose major subject is internal medicine. Such a student will require further training in the fundamental sciences, more particularly in pathology, bacteriology, immunology, physiology and pharmacology. Of these fundamental sciences one might properly be selected as a chief minor subject. Should pharmacology be so selected, the student while receiving his main training in the clinic should also be given special training in pharmacology. This could be accomplished by having him assist in pharmacologic demonstrations and experiments or in the teaching of pharmacology and therapeutics. He might also do special work on a pharmacologic problem that possesses clinical interest but which requires animal experimentation. The second type of graduate student would be the one who has chosen pharmacology as his major subject but who expected ultimately to go into internal medicine. In such a case the course would not differ greatly from that taken by the graduate student who planned to remain in pharmacology. The former, however, might more properly assist in the teaching of therapeutics and conduct a clinical research on some pharmacologic problem.

Coming now to the training of the pharmacologist proper, there is first of all to be conridered his preparatory training, and secondly, his special graduate instruction. The preliminary training would be practically the same as is demanded for admission to the best medical schools today, viz.: two years of college work or more, if possible, the same to include German and French, and the usual sciences. It is advisable that more than the minimum amount of chemistry and physics should be taken, if possible. It should be clearly understood that the preparatory training mentioned is to be considered to represent only the minimum amount which is to be demanded, and that the possession of a Ph.D. degree with chemistry as a major will be a very distinct asset to the future pharmacologist. In the medical school, the student should take the full course leading to the M.D. degree; but in those schools allowing electives, these should usually be selected from the group including chemistry, physiology and pharmacology.

After graduation, it is highly desirable that he should take a year's general internship. In this matter, pharmacology in its demand differs from some of the other preclinical branches in which the Ph.D. degree may suffice in place of the M.D., and the intern year is not so important as it is in pharmacology.

Coming now to special training, it may be said that it should extend over a period of at least three years. This training may be secured in one institution, but it is advisable, on account of its broadening effect, that the student should migrate from one institution to another.

Medical school authorities must recognize that it takes as much natural ability, time and energy to train a pharmacologist as it does to train men for the other branches of the medical sciences. Therefore, if pharmacology is to compete with these sciences for men, it must do so on equal terms; it must offer equal opportunities and equal rewards. If pharmacology is not to be on an equal footing with physiology, biologic chemistry and other sciences, and if the men properly trained are not to receive just treatment, there is no need to provide courses for graduate instruction. The courses may exist on paper, but no one will enter them.

POSTGRADUATE TEACHING IN PATHOLOGY

DR. JAMES EWING, New York: Since the interpretation of data gathered in the pathologic laboratory is possible only in the light of clinical information, a preliminary clinical training, preferably in a large hospital, or in several special hospitals, will greatly increase the beginner's chances of advancing far in pathology.

Teaching experience is a valuable influence in the training of a pathologist. It broadens his interests, systematizes his work, reveals defects in his knowledge, and trains him in the use of language and literature, while such service may be the source of a salary which will tide him over lean years. A transfer from one branch of pathology to another, or to a systematic course in bacteriology, would form a desirable variation in the teaching experience. Routine teaching, however, should not consume a substantial part of the young pathologist's time or energy. The major part of training in pathology is best accomplished in a university hospital laboratory, in which there are numerous necropsies, a constant flow of material of all types, and a full and competent discussion of the problems of disease as they arise in an active general hospital. Here also he may gather profit by frequent visits to the wards, the

operating room, and the roentgen-ray department of the hospital, to keep him in touch with the problems of the clinic.

A synopsis of the scheme thus outlined for the training of the higher grade of pathologist may be presented as follows:

Course for degree Ph.D. in Pathology.
Prerequisite—M.D. degree from a good medical school.
One or more years as hospital intern advisable.
Three years' service in a university or hospital laboratory.
Teaching experience, not over ten hours weekly, for which a salary or fellowship is provided.
Advanced work of practical character, or as instructor in bacteriology.
Minor course in biochemistry, embryology, etc
Reading of literature; case reports.
Production of a thesis.

In order to maintain candidates for the degree in pathology over the period of three or more years, a system of fellowships is highly desirable, if not essential.

The matter of awarding the Ph.D. degree in pathology to undergraduates in medicine has revealed a difference of opinion in the committee. The writer and others hold that this degree in pathology should signify not only general competency, but some special fitness in that field, and the ability to accomplish in it independent original work.

University laboratories should provide special courses in subjects in which the school is particularly well equipped, for pathologists desiring additional training. These courses may include: experimental pathology; medicolegal pathology; necropsy technics; surgical pathology; tumor diagnosis; tropical diseases; serology; clinical microscopy, and chemistry. Comparatively few American pathologists have failed to spend one or more periods in pursuit of such courses in European laboratories.

From the inspection of many of the postgraduate courses in the clinical specialties now being given in this country, we feel that they are generally of a high order from the clinical side, but that the deficient training of the average student in general pathology often renders the pathologic work rather superficial.

The committee believes that the present standard of pathologic service in the great majority of hospitals is exceedingly low, and it feels that this condition has seriously affected the welfare of patients and lowered the efficiency of hospital practice to the danger point. That this situation is clearly recognized by clinicians, especially since the revelations of the war, is also apparent from the insistent calls for hospital pathologists that cannot possibly be met. There is little doubt that this dilemma has been reached mainly because of the misconceptions of the clinical staffs of hospitals, and of some medical schools, regarding the functions of a pathologist.

What are the functions of the hospital pathologist which make him essential in a well ordered institution?

1. To investigate the causes of the fatalities that occur in the hospital, to elucidate the course of the disease, record the lesions observed to correct partial or erroneous diagnosis, and to help to reduce the preventable deaths.

2. To study the obscure and the rare cases and problems that arise in the laboratory, wards and operating rooms, with all means at the disposal of a well equipped pathologic laboratory, including pathologic anatomy and histology, bacteriology, chemistry and serology.

3. To keep himself familiar with the literature and progress of the medical sciences, so that he may become a competent authority in his own field, and prove of service to his clinical colleagues, most of whom have less time to devote to such pursuits.

4. To serve as consultant in the wards and operating rooms, where by virtue of his knowledge, especially of pathologic anatomy and bacteriology, he should be able to bring data with which, as a rule, the clinician is less familiar.

5. To cooperate with the internist in general diagnosis; to serve the surgeon in gross anatomic and physical diagnosis so that both may escape the thraldom of the frozen section, the probatory incision and the exploratory laparotomy; to work out with the radiologist the interpretation of plates. The wide use of the pathologic conference shows how the progressive clinical staff values the service of the consulting pathologist.

6. To supervise the work of the clinical laboratory, maintaining technical standards, restraining excessive demands, establishing correct indications for the resort to laboratory tests, and aiding in clinical research.

7. To pursue systematic research in problems of pathology, and to stimulate and train others in such work.

For the continued supply of such men the committee is deeply concerned, and it regards this field as the most important in postgraduate training in pathology.

As preliminary training for such posts, we recommend the course outlined for the degree of Ph.D. in pathology, but there seems little probability that many men can take the necessary time for such studies before they become absorbed in routine hospital work.

Dr. Louis B. Wilson, Rochester, Minn., chairman of the Council's Committee on Graduate Medical Education, presented a summary of the reports on graduate training in the specialties by means of charts.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Thirty-First Annual Meeting, held in Chicago, March 8, 1921

TUESDAY, MARCH 8—MORNING

Higher Medical Education: The True Interest of the Public and of the Profession

DR. WILLIAM PEPPER, Philadelphia: The time has come to consider seriously whether the so-called "two year premedical course" is producing students properly prepared to study medicine. Already five medical schools have evidently decided that they believe that two years of college work is insufficient. Quite a few medical teachers feel that a third year of chemistry is needed, so that the student will have had qualitative analysis in addition to general inorganic and organic chemistry. The two year premedical course contains only specified amounts of physics, biology, chemistry, English and French or German, and in consequence practically no time remains for any other college subjects. The best plan would be a combination of seven years, the college granting its undergraduate degree at the completion of the first year in medicine. For years to come some medical schools will limit the size of their classes and select the best students, men with more than the minimum entrance requirements. Students are beginning to realize this; and in order to increase their chances of getting into the medical school of their choice, they are taking more than the required two years of premedical study. Until the colleges of arts and science cooperate with the medical schools, the number of medical schools raising their entrance requirements above two years will remain rather limited, but the number of students who will present for admission to medical schools more than two years of college work will steadily increase, and eventually the requirement will become much more common than it is today.

Teaching of General Medicine

DR. CHARLES P. EMERSON, Indianapolis: The objects of the course in general medicine are, first, to train the many students who will practice general medicine, and, second, to lay for the few who plan to specialize in internal medicine a satisfactory foundation for their advanced work. Six hundred and forty hours is entirely too brief a time in which successfully to teach general medicine. The spirit of research should permeate the entire medical department. A clinical teacher fails if he is not engaged in some medical research, and the senior students also should be encouraged to undertake limited problems. We approve of the requirement of a thesis for graduation. Some clinical teachers believe that the weeding out of unfit students should come during the premedical and preclinical years. We would protest. Students may lead their classes in the premedical sciences and be "unfits" in the clinical branches. The clinical teacher of today should be allowed the time to review with his students each medical science from the angle of his own subject. Not only will the best of students each year forget a certain (not small) amount of each science unless it is reviewed, but it is also true that a real anatomist and a real chemist will not teach anatomy, chemistry, etc., in a manner quite satisfactory to the internist or the surgeon; and the more excellent these courses as judged by university standards, the greater the specialists these teachers are, the more unsatisfactory at first to clinical teachers will the results be.

All laboratory examinations should, so far as is possible, be discussed in connection with the history and physical examination of the patients. Tht present sharp separation of laboratory and ward should be condemned strongly. There should be a course in physical diagnosis during the second semester, consisting of one, or better two, demonstrations each week to the class as a whole, and one practice period of two hours each week for each student who also shall be required to practice outside of class hours. Surface anatomy of the living and regional anatomy, so far as it is important in medical diagnosis, should not be combined with the course taught in the surgical curriculum, since it should be very different. Recitations in clinical medicine from a textbook might well begin in the second year after the course in general pathology is about half completed, and should be continued during the first half of the third year. The purpose of this recitation is to teach something of diseases rarely seen in the wards and to emphasize the cardinal feature of each common disease. There are some good arguments in favor of a few clinical lectures during the second year in order that the students may get the clinical point of view early; but in a crowded curriculum this is hardly worth the time it would consume, and especially since the same object may be attained more profitably by developing the clinical side of the demonstrations in physical diagnosis and surface anatomy. There

should be thirty-six weeks of clinical diagnosis, two periods of laboratory medical diagnosis of at least two hours each and one hour for recitation each week. No more than one third of each laboratory period should be spent in the formal demonstration. During this course the student should examine as many different specimens as possible. The examination of each specimen should be preceded by a brief statement of the case concerned and in some cases by the demonstration of the patient himself. The student as clinical clerk should be assigned to one medical service, and be the assistant of but one intern at a time and responsible to him for definite ward duties. He should have his own desk space, his own locker and individual apparatus. At least one clinical medical conference should be held each week attended by the entire class, a conference at which the teacher is in large degree the presiding officer and critic. Here the students will demonstrate their most instructive cases. There should be dispensary service in the third or fourth years, preferably the fourth, four days a week. Some schools offer many short courses in special medical topics. Several schools offer elective courses in experimental medicine open only to the best students of the class. The students should be required to report on the important literature of their interesting ward cases. It is important also that during the third or fourth years the students be actually trained in the use of current literature. Clinical pathologic conferences are valuable. We urge that there be given during the third or fourth year a well planned course in the history of medicine of at least one hour a week for thirty-six weeks. One of the strongest arguments in favor of the study of the history of medicine is our present disregard of the various forms of physical therapy and the resulting strength of the many popular schools of irregular practitioners. There are strong arguments in favor of a department of environmental medicine. While hygiene is so closely related to bacteriology that it may, in part at least, be taught as a second year subject, preventive medicine, on the other hand, presupposes a fairly complete course of medicine and logically should be taught toward the end of the senior year. We fail to know any reason which justifies the presence of the subjects hygiene and preventive medicine earlier in the curriculum. The lectures in life insurance could be enlarged to one of the most valuable courses in medicine. The actuaries of life insurance companies are collecting valuable statistics which can define accurately to us the significance of clinical signs and symptoms and which should in time place prognosis on a surer foundation.

DERMATOLOGY AND SYPHILOLOGY

Dermatology and syphilology should be taught in one department, but should be correlated with other departments. Dermatology and syphilology should have an important place in the curriculum. The majority of communicable diseases have cutaneous signs among their early manifestations. The personnel of the teaching staff should comprise a full professor sitting in the faculty as chief of the department of dermatology and syphilology. The course in dermatology and syphilology requires a minimum of from eighty-five to 100 hours. Adequate equipment should be provided to teach the special treatment of skin diseases and syphilis. In conjunction with a department of preventive medicine, the department of dermatology and syphilology should give the medical student careful training in the social service methods of following up those afflicted with the great group of communicable skin diseases and most particularly with syphilis.

The course might be thus divided: A preliminary course of fifteen lectures in the third year: 1. To review the physiology and histology of the skin and to study the method of vesicle formation, edema, acute and chronic inflammatory processes as they occur in the skin, and the mode of formation of papules and elementary skin lesions. 2. To study the pathology of the more important dermatoses and of syphilis. 3. To study cutaneous reactions, sensitization to light and its various reactions to chemicals of all kinds, including pollens, dyes, professional dermatoses, etc. 4. To cover the historical outline, parasitology and immunologic processes in syphilis. In the fourth year: 1. From thirty to thirty-five clinical lectures on dermatology. 2. From twenty to twenty-five clinical lectures on syphilology. 3. From twenty to twenty-five hours of section teaching. The department of dermatology and syphilology should have at its disposal a certain number of hospital beds so that the student may become familiar with types of dermatoses and syphilitic lesions not seen in an ambulatory clinic.

Surgery and Surgical Specialties

DR. HUGH CABOT, Ann Arbor, Mich.: The very strong tendency of recent years to what may be called "block teaching" in the preclinical subjects has had definite advantages in enabling these subjects to be driven home and thereby create a solider foundation. On the other hand, it has also had a distinct tendency to create the impression that the branches so taught are done and over with. This produces an undesirable isolation and accentuates the tendency to a sharp break between the first two years of the curriculum, which are largely preclinical, and the last two years, which are largely clinical. Surgical diagnosis cannot be taught, except with the most intimate association with pathology and bacteriology. Surgical treatment cannot be taught without the most intimate association with anatomy. It seems fairly clear that it is not feasible to begin the teaching of surgery earlier than is at present the case.

Very desirable exercises tending to draw together surgery, pathology and bacteriology are the careful review of all patients coming to necropsy, such discussions to be conducted by the surgeon, the pathologist and the bacteriologist jointly. Greater effort must be made to interest the teachers in these departments in the clinical problems and lead to their closer association with the surgeon, while in the field of anatomy effort must be made to increase the working knowledge of the surgical teachers in embryology and anatomy as they come up in daily relation to surgical diagnosis and operative surgery. Unless we are prepared to regard all diagnosis as essentially medical, and to admit that surgery is only a department of applied therapeutics, the teaching of medicine and the teaching of surgery should go hand in hand. But there is grave danger, with the present marked tendency to separation in the teaching of these subjects, of the development of a medical view versus a surgical view of the same condition. With the present general distribution of hours between the department of medicine and the department of surgery we are in accord.

The developments of recent years have shown a strong tendency to abandon didactic and ex cathedra teaching and rely more on those methods which bring the student and the patient into closer contact. Didactic lectures are not a desirable method of teaching surgery as a whole. If used on too large a scale they tend simply to relieve the student of the requirement to read, which is, in fact, for him a most important method of learning.

The substitution of the clinical for the didactic lecture has been a common and very wise practice. It is not a substitute for section teaching or bedside instruction, but rather a substitute for the didactic lecture, which must be illustrated, if at all, only by drawings and diagrams. The older practice of conducting quizzes based on textbook reading has been largely superseded by quizzes based on clinical lectures, bedside and section teaching. Section teaching is essential when dealing with the relatively large classes that are today the rule. It is the modern answer to the grave damage that resulted to the teaching of surgery when medical schools became thoroughly organized and the old days of "walking the hospital" disappeared. Within reason, sections should be made as small as possible; but with large classes this will require a number of instructors, which is likely to prove a severe strain on the budget.

The practice of introducing students directly into the hospital as part of its machinery fosters in the student the practice of getting close to his patient, and accentuates the necessity of some understanding of a patient's psychology as a prerequisite to obtaining a decent history or to making a satisfactory physical examination. One of the most important things in the teaching of medicine is that the student should learn how and where to obtain information on any given subject.

The teaching of surgical specialties should fit into the general scheme of the teaching of surgery as part and parcel of the regional teaching. The surgical specialties are better taught over at least a two-year period rather than crowded into one.

The plan for the whole teaching of surgery must be made by the chief of general surgery in the interests of balance. Early in the teaching of the principles of surgery must be laid down the underlying principles of the management of fractures and dislocations. They may be taught early in the course, and as these principles are those underlying much of orthopedic surgery, they may often be taught to advantage by the orthopedic department. The same view applies to the diseases of bones, including osteomyelitis and tumors.

As a preliminary to the teaching of the diagnosis and treatment in genito-urinary surgery, the physiology and pathology of renal function should be reviewed and the tests for renal function demonstrated and actually carried out by the student. The physiology of urination should be stressed, and the anatomy and physiology of the genital tract in the male reviewed. Then, thorough instruction in urethral and genital infections should be given, as these conditions are constantly facing every practitioner in every field. It is desirable, where possible, that the teaching of venereal infections and syphilis be conducted more or less jointly, and it will save some time. Next should be laid down the principles of urethral, bladder and ureteral examinations and the place of cystoscopy in the diagnosis of urinary lesions.

The diagnosis of diseases of the ear, nose and throat depends on methods of examination so technical in character and so difficult to acquire that it seems necessary to begin the work by a short intensive course in the technic of examination. This is best given in the junior year, and forms one of the so-called demonstration courses given to sections as large as the clinical facilities and material will permit. Throughout the course the effort is made to impress the student with the fact that he has not been created a specialist in this line but that he has been given merely an outline of the work necessary for every general practitioner and that, to acquire even a working knowledge of the subject, postgraduate work is necessary.

It is recommended that the undergraduate teaching in ophthalmology be given in the third and fourth year of the prescribed medical course. While it is impossible to give sufficient instruction in the regular medical course to qualify one as a specialist, the student should know the possible ocular manifestations of general disease processes and be familiar with the more ordinary disease conditions of the eye, especially with those in which the sight of the patient is in jeopardy.

No attempt should be made to make roentgenologists out of undergraduate students. They must know the theory and principles of roentgenology, and above all, they must understand the place of this diagnostic method in the field of surgery. It is sound practice to begin the teaching in the third year and carry it through to the end of the course, and this teaching should roughly follow the lines already laid down for the other specialties. Much use should be made of roentgenology in the joint medical and surgical clinics, as in no other way can the varying position of the method be kept constantly before the student.

DISCUSSION

DR. JAMES EWING, New York: The work of the internist is now becoming so extensive that we must look about for some means of limiting the scope of his work which we can safely bring before undergraduate students. We must differentiate between the primary and secondary phenomena of disease. In teaching the undergraduate students we ought to confine our attention largely to the primary phenomena of disease and make it clear that when we examine the blood and urine and various functions of all organs, we are digressing from the essential principles of the practice of medicine. Unless we do that, there is going to be somewhere in the training of the student a very serious deficiency. I find that men are deficient in their knowledge and education of the primary phenomena of disease. The great majority of medical students turned out from the best medical schools are unable to recognize the beginning of cancer in the various organs. They have never seen it. They do not understand the methods of differentiating benign from malignant processes in these organs.

DR. G. CANBY ROBINSON, Nashville, Tenn.: We should attempt to bring internal medicine and special pathology together. Special pathology and internal medicine should parallel each other.

DR. J. J. R. MACLEOD, Toronto, Ont.: We have evolved a curriculum which conforms to the standards you have laid down, but which makes a decided constructive attempt to correlate more accurately the clinical with the laboratory subjects. Throughout the whole of the course the student must be made to realize that the science of medicine and surgery depends on the application of the fundamental sciences—physics, chemistry, biology, etc. Physics is given early in the course. We take him through physiology, biochemistry and anatomy, and then into the clinic, where he is brought face to face with the practical application of the principles of these sciences in the practice of medicine and surgery. In the United States many of the premedical and fundamental medical sciences are given in schools in buildings that are situated at a distance from the clinics, and there may be practical difficulties in working out the correlation; but I imagine that in the future laboratories in the fundamental medical science will be brought into closer touch geographically with the clinical wards. Teachers in the clinical branches should be given opportunity to talk over informally the application of physiologic and biochemical methods in the study of the symptoms of disease. We are making an attempt to do that in Toronto.

DR. W. F. R. PHILLIPS, Charleston, S. C.: Preclinical teachers are asked to furnish a scientific basis on which the art of medicine is founded. The clinician should tell the teachers of physiology, pathology, etc., what tools he finds defective, and then an endeavor should be made to correct those defects. As a teacher of anatomy, I cannot impart knowledge and make an anatomist out of a student in the length of time I have at my disposal.

DR. ROBERT WILSON, Charleston, S. C.: I should like to emphasize the need of readjusting the relation between ward teaching and dispensary teaching. Our students are not familiar with the clinical aspects of the disease problem, but in attempting to unravel those diseases when they present themselves in their incipient forms in dispensary service, I feel that we ought to put senior students in the dispensary and junior students in the wards, or make an arrangement by which the seniors and juniors shall work in wards and dispensaries.

DR. LOUIS B. WILSON, Rochester, Minn.: There are certain personal characteristics that should be developed in the medical student, even at the sacrifice of a little knowledge. The first of these is thoroughness. The enormous number of subjects now taught in medical schools is materially reducing the sense of thoroughness necessary in the graduate. Students do not seem to know what it means to go absolutely and completely to the bottom of a subject. Another characteristic is modesty and real honesty to oneself.

DR. M. G. SEELIG, St. Louis: By intensifying the art side of surgery we have developed what Treves described, as the greatest menace to surgery, that is the simon pure brilliant technician. The only man who is the real, qualified, well rounded surgeon is he who has approached surgery from his student days under the inspiration and instruction of properly impassioned instructors with the idea that the fundamental regulating factor in surgery is the scientific basis on which it rests.

DR. GEORGE E. ARMSTRONG, Montreal: There is a great difference between the teacher and the communicator of knowledge. I want the student to record his observation, say what his impression is, and you will be surprised how far he can go without teaching him. It is important for a student to see an abdomen opened and to know what it looks like. The reason and instruction you give him after that are much more valuable; he appreciates them more; it is a part of his knowledge.

Dr. B. D. Myers, Bloomington, Ind.: The anatomist, in addition to teaching anatomy, is confronted with the necessity of teaching the language of medicine, and anatomic nomenclature is not small. There is danger in connection with the quiz of the knowledge of the student being brought out in a fragmentary way. If the student is called on in the so-called quiz to give a discussion of the subject, it is much better.

Teaching of Obstetrics and Gynecology

Dr. J. Whitridge Williams, Baltimore: Obstetrics and gynecology should be merged into a single department for teaching purposes, irrespective of what the individual members of the staff may prefer to do in their private practice. The reason for this recommendation is twofold: First, that the two subdivisions embrace the entire field of the physiology and pathology of the female reproductive organs, and thus constitute a subject sufficiently important to occupy fully the attention of well trained and intelligent men; and, secondly, they overlap to such an extent that when taught separately considerable reduplication of teaching effort must occur, which leads to an unnecessary waste of time. The essential surgical training can be obtained only in gynecology, and, conversely, correct gynecologic thinking requires extensive obstetric training. In this country most gynecologists have no obstetric training, with the result that, although one half of their work originates from injuries or infections occurring at the time of labor or abortion, they take no interest in their mode of origin or in preventing their occurrence.

The chief cause for the prevalence of poor obstetric training in this country lies in the tardy appreciation by authorities of medical schools of the physical needs of the department of obstetrics. Until recently it was generally believed that obstetrics could be taught suitably by lectures, supplemented by an outpatient service in the homes of the poor, and a few beds in a corner of the hospital for operative cases. An adequate supply of indoor clinical material is essential to the proper teaching of obstetrics, and its lack cannot be supplied by work in the homes of the poor, no matter how extensive.

Men of the type necessary to head women's clinics, such as we have outlined, will be chosen because they have demonstrated that they will be prepared to spend the rest of their days in demonstrating to younger men the joy of a life devoted to the pursuit of knowledge and to the welfare of the patients and students committeed to their care.

In a well organized service, every student, as soon as he has learned obstetric anatomy and the physiology of normal labor, should serve for at least two weeks in the dispensary, spending the first week in learning the essentials of obstetric examination, palpation and pelvimetry, and the second week in becoming acquainted with the details of prenatal care. Later, he should be afforded additional facilities for perfecting himself in the technic of pelvimetry and palpation on patients awaiting delivery in the wards, and then be given the opportunity to take part in at least ten normal deliveries in the ward, being required to follow each patient from the time of admission to the delivery room until she is discharged from the hospital. Toward the end of his experience, each students should be allowed to deliver several patients under the supervision of a competent instructor. In the postpartum clinic, the student should be taught that his responsibility does not end with the delivery of the patient, but continues until she can be discharged in such physical condition as to be able to attend to her household duties without effort and to suckle her child.

The fundamental obligatory courses should be conducted by the professor and by the senior members of the department. The professor should personally conduct such courses as demonstrate the interlocking relations between gynecology and obstetrics, and he should also take a personal, although necessarily small, part in the various phases of dispensary activity. The value of obligatory instruction in any subject lies not so much in the time occupied as in the manner in which it is given. If the student is brought into direct personal contact with the personnel of an enthusiastically conducted clinic he will receive an impression concerning its aims, which he will fail to get from freer access to a service of much larger size conducted in a perfunctory manner.

Discussion

Dr. Joseph B. De Lee, Chicago: I agree with Dr. Williams as to the necessity of having gynecologic and obstetric teaching under the headship of one professor, a full-time man. The difficulties of getting a full-time man are great, and in most cities insurmountable at present, for financial reasons principally.

Dr. L. E. Burch, Nashville, Tenn.: In a university hospital the man in charge of obstetrics should also be in charge of gynecology. He should have had a broad obstetric and gynecologic training. I do not mean that the head of the department should practice either gynecology or obstetrics alone. It is not possible for a man to attend to a large obstetric service and at the same time carry on a large gynecologic practice, for the reason that if he is up the greater part of the night attending to obstetric cases it is impossible for him, if in charge of the department, to do himself full duty or his patients full justice. In teaching I have obtained the best results by assigning a lesson in a standard textbook and then emphasizing the important points, elucidating the subject with models, charts, lantern slides, and pathologic specimens.

Dr. James M. H. Rowland, Baltimore: Combining gynecology and obstetrics into one chair in charge of a full-time teacher would tend to give the best teaching. As to the character of teaching, there is no doubt that a well demonstrated case of labor in a hospital is worth more than any case can possibly be that is seen on the outside.

Dr. Jennings C. Litzenberg, Minneapolis: From a pedagogic standpoint, obstetrics and gynecology are inseparable. You cannot make a good obstetrician without training him gynecologically, and you cannot make a good gynecologist without an extensive obstetric training.

Dr. George M. Kober, Washington, D. C.: In our university hospital, 250 beds are devoted to obstetrics and gynecology, about one third the bed capacity of the hospital. We have a prenatal clinic and an infant welfare station.

Dr. Alice W. Tallant, Philadelphia: I should like to make a plea for an outdoor obstetric service. After students have had indoor work demonstrated to them in their third year of obstetrics, they can gain valuable knowledge from studying and coming in contact with obstetric patients in their homes.

Undergraduate Medical Curriculum

Dr. Frank Billings, Chicago: The character of the reports made by committees representing the fundamental and the clinical branches on the principles and policies which should be followed in undergraduate and in graduate medical training indicates the need of a decided modification in the curriculum of the medical school. Specialism in the teaching of and in the practice of medicine has been permitted to warp our judgment and to divert us from the proper course to pursue in the attempt to educate and train the student of medicine. There are not a sufficient number of efficiently trained general practitioners or of adequately trained specialists to meet the public need. We are all practically in agreement that primarily the student should be educated broadly and comprehensively so that he may be qualified to practice general medicine. If he is desirous of becoming an internist, a general surgeon or a specialist in one of the narrower fields of practice, he must have adequate postgraduate medical training to qualify him for the work. Therefore, the chief product of the medical school should be the graduation of resourceful, broadly educated and well trained practitioners of medicine.

We may arrive at a better conception of what the education of the general practitioner should be if we consider what are the obligations and responsibilities of the general practitioner to the community he serves. In practice, he is a family physician, and in this, his chief rôle, he is responsible for the safe and sane treatment of the family in illness and injury. He counsels and advises the family on all problems which confront it in relation to individual and general hygiene, public sanitation, education and community obligations and responsibilities. He must have a good general knowledge of the principles relating to epidemiology, immunology, sanitation,

medical jurisprudence and sociology, that he may act rationally when confronted with the problems which relate to the application of tried and proved measures of disease prevention for the protection and welfare of the multiplied families —the community for whom he is responsible. He must advise, guide and safeguard the expectant mother through gestation. He must so manage the labor that it will terminate within a reasonable time without instrumental interference and without serious injury to the mother and child. He must be able, when necessary, to meet the not infrequent obstetric emergencies, and especially to recognize the serious complications at an early stage of labor so that consultation may be secured, if he is not technically able fully to safeguard the two lives for which he has assumed responsibility. He must be able to give the best advise and management in the care of infants and children. This implies a knowledge of the underlying principles and also the actual personal contact and personal experience in a modern infant and child welfare clinic in a medical school training. He must understand the principles of psychology and of neuropsychiatry to enable him to recognize mental abnormalities in childhood and in adult life. For these mental conditions and their management and treatment he will usually not assume responsibility, but will direct the related responsible individuals to physicians qualified in this work. He must be a well trained diagnostician and generally able to recognize existing morbid tissue changes and the related abnormal functions. He should be able to trace the beginning of the pathologic changes and have a reasonable comprehension of the ultimate result.

He should know what management and treatment to give. He should have command of a selected few tested and tried pharmacologic products which he may use with skill and usually with great benefit to the patient. His knowledge of the principles of immunology and bacteriology will enable him to apply recognized specific serums and a few antigenic vaccines with judgment and skill therapeutically and prophylactically. In the general management of his patients he will utilize rest, a proper environment and, so far as available, physical treatment. He may easily command hydrotherapy, thermotherapy and occupational therapy, and in some communities electrotherapy and massotherapy. He will have a proper conception of the value of calisthenic and other active exercises in the restoration of the functions of the locomotor apparatus. He will understand asepsis and will perform minor and emergency operative surgery with confidence and ability. He will especially care for emergency surgery in the form of fractures of the bones and the uncomplicated joint dislocations. His knowledge will enable him to know his limitations in major surgery and to safeguard the life and health of his patients by reference to well qualified surgeons.

This statement of the functions of the general practitioner indicates the need of a broad academic education and mental training preliminary to the study of medicine. It is not necessary that I enumerate the various steps which should be taken in the medical training of the family practitioner. The inference is plain that he must have a good knowledge of general and physiologic chemistry, of human anatomy and physiology, of pharmacology, of general pathology with constant training through the four years of residence in morbid anatomy, of epidemiology, immunology and psychology. In the clinical branches he must have the training of his brain, special senses and hands in the recognition of disease. He must learn to use the simple diagnostic aids in the form of instruments and laboratory tests. With this knowledge of the methods of diagnosis he must have constant and daily opportunity to study disease as expressed in the ambulatory and ward patients. He must have an opportunity to observe the etiologic relations of occupations, environment, social conditions and other factors to disease. He must learn and recognize the importance of community as well as individual disease. He must have the opportunity to observe the results of medical treatment and management and the final condition of the patient after operative surgery. He must have an opportunity to witness minor surgical operations, emergency surgery and especially to have practical training in the treatment of fractures of the bones and of dislocations. In the hospital, he should have an opportunity for the practical study of dietetics and of dietotherapy. He should have practical experience in the measures of disinfection in the sick room and especially in the control of communicable diseases. In the fifth, or intern year, the major part of the training should be along the same lines as that of the third and fourth years in residence. The bright and energetic student will find opportunity to apply himself to elective investigatory work with much benefit to himself. But the large majority of the medical class will be fully engaged in this broad and necessary practical training.

Finally, it must be said that in addition to the educational qualifications, both academic and medical, the family physician must be a man of character. His daily life must be a practical expression of honesty, morality, and resourcefulness in service to his patients. He will have a due consideration of his own health and responsibilities and at proper periods will play as he works with well directed energy, giving and asking half the road and fair play.

(To be continued)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Graduate Course for Colored Physicians.—A four weeks' graduate course on medicine for colored physicians will be given at the John A. Andrews Memorial Hospital, Tuskegee Institute, beginning April 4. It will consist of lectures, moving picture demonstrations, of surgical technic, roentgen-ray demonstrations, laboratory teachings, etc. Courses will be held all day and evenings.

Milk Dealers Fight Pasteurization.—Dr. Gottfried Kohler, assistant commissioner of health of Chicago, was called last week to Birmingham to testify as an expert on the value of pasteurization of the city's milk supply as a health measure. The city of Birmingham has an ordinance which provides that all milk, except certified milk and grade "A," shall be pasteurized. The milk dealers' association of that city brought suit and obtained a temporary injunction enjoining the city from enforcing the ordinance. Desiring to have the ordinance sustained, the health authorities of Birmingham called Dr. Kohler to testify as an expert in the case.

CONNECTICUT

Health Department Bills Lost.—Following the acceptance of unfavorable reports from the committee on public health and safety, the house rejected bills providing an appropriation for a laboratory to be used by the state department of health and the agricultural experiment station, and for the establishment of separate bureaus dealing with public health nursing, child hygiene, and education. Measures that would give the state department of health control of inspection of meat and other food products were also rejected.

Changes at Yale University.—The graduate school has been authorized to confer the degree of Doctor of Philosophy for work in clinical medicine, and in pharmacology and toxicology. Dr. Yandell Henderson, hitherto professor of physiology in the Yale Medical School, has been transferred to the Graduate School of Yale University under the title of Professor of Applied Physiology. The tuition fee in the medical school, beginning with the next university year, has been increased from $240 to $300, and announcement is made that beginning with a year from next fall three years of collegiate work, or its equivalent, instead of the present two years shall be required of all candidates for admission to the school of medicine.

GEORGIA

School of Public Health.—The Georgia Medical College at Augusta, having received a recent legislative appropriation of $20,000 for a school of public health to train physicians as county health officers in the state—supplemented by funds from the International Health Board of the Rockefeller Foundation—concluded a two weeks' intensive course of instruction for public health workers. Dr. Charles C. Bass, Tulane University, New Orleans; Dr. Ernest C. Levy,

director of public welfare, and Dr. H. H. Hibbs, director of school social work and public health, Richmond, Va.; Dr. Watson S. Rankin, commissioner of health of North Carolina, and Dr. Leslie L. Lumsden, U. S. Public Health Service, were among the special lecturers. Educational films on malaria, hookworm and venereal diseases were shown.

ILLINOIS

Commissioned Medical Officers Organize.—The Association of Military Surgeons of Illinois was organized in Chicago, March 17, as a state branch of the Association of Military Surgeons of the United States, with the following officers: Gustavus M. Blech, president; William McIlwain Thompson, vice president; James J. McKinley, treasurer, and Alfred deRonlet, secretary. The association is composed of commissioned medical officers of the Army, Navy, Public Health Service and National Guard, active or discharged (reserved). Officers and former officers who desire to join should address the secretary at 7 West Madison Street, Chicago.

Chicago

Dr. Mendel Speaker Before Chemists.—Dr. Lafayette B. Mendel, professor of physiologic chemistry, Yale University, and a member of the Council on Pharmacy and Chemistry, A. M. A., spoke before 500 members of the Chicago Section of the American Chemical Society on Friday, March 18. Preceding the talk, a dinner in honor of Dr. Mendel was served at the Quadrangle Club, University of Chicago.

Survey of Child Health Complete.—The Division of Child Hygiene of the health department has completed the survey referred to in these notes in a recent issue with the following results: Out of nearly 500,000 children examined, 3,698 were found with discharging ears and 2,979 with impaired hearing. Of affected ears 3,066 were found with one ear affected and 632 with both ears. Those deaf, all degrees, in one ear were 2,021; both ears, 958. Discharging ears as sequela of contagious diseases, 1,724; tonsil and adenoid affections, 1,047. Deafness as sequela of contagious diseases, 1,166; tonsil and adenoid affections, 1,356.

INDIANA

Indiana Physician Fined.—It is reported that Dr. Ira H. Jordan, Michigan City, pleaded guilty to prescribing liquor unlawfully and was fined $400 in court, at Laporte.

Lung Medicine Bill Defeated.—The house has voted to postpone indefinitely further consideration of Senate Bill 120 providing for state inspection and testing of lung medicines.

Fines for Misbranding Articles.—It is reported the Wright Medicine Company, Peru, was recently fined $100 and costs for shipping misbranded articles from Indiana into Missouri. The article was fraudulently represented as being a remedy for rheumatism.——The Dermacilia Manufacturing Company, Hammond, was recently fined $100 and costs for shipping articles misbranded "Dermacilia Eye Remedy" and "Dermacilia Ointment."

Hospital News.—Estimates and plans are being developed for the building of additional wings, to cost approximately $100,000, to Julietta Hospital, Indianapolis, for the incurable insane, to provide hospital facilities for the inmates of that institution.——In order to relieve the crowded condition in the Central Hospital for the insane there will be a redistribution of population in the five state hospitals. There are 1,410 patients in the Central Hospital at the present time, and 359 applying for entrance. The Northern Hospital has 1,016 inmates with 45 applicants; the Eastern 899 inmates with 75 applicants; Southern 781 inmates with 31 applicants; the Southeastern 1,202 inmates with 34 applicants.

KENTUCKY

Course in Public Health at Louisville.—The University of Louisville has established a course in public health consisting of certain elective subjects in the junior and senior years, certain vacation field work in the summer following the junior year, and a fifth year corresponding to a hospital internship, following which the student may receive the degree of Doctor of Public Health in addition to the M.D. degree.

MAINE

Secretary for Public Health Association.—Mr. Walter D. Thurber, managing director of the Illinois Tuberculosis Association, has been appointed executive secretary of the state public health association to succeed Mr. W. A. Harris, resigned.

Personal.—A bomb exploded while Dr. John L. Pepper, Madison, was opening a package received by mail. His right hand was blown off, his left hand and lower jaw injured and his eyes filled with powder. It was necessary to amputate his right arm.

MARYLAND

Personal.—Dr. Hugh H. Young, director of the James Buchanan Brady Institute, Johns Hopkins Hospital, who has been under treatment at the hospital for a slight heart disturbance, has left for Atlantic City for a month's rest.——Dr. Howard A. Kelly has left for his annual vacation in Florida and will spend several weeks hunting and fishing.——Dr. Henry J. Berkley recently underwent a slight operation at the Johns Hopkins Hospital.

MASSACHUSETTS

Leper Colony Abandoned.—Penikese Island, Buzzards Bay, was abandoned as a leper colony, March 10. The thirteen lepers on the island with three from Bridgeport, Conn., and two from Richmond, Va., were transferred by special car to the federal leprosarium recently established at Carville, La.

Personal.—Dr. Selskar M. Gunn, associate director of the International Health Board of the Rockefeller Foundation, and formerly associated with the Massachusetts Institute of Technology, has been appointed by the government of Czechoslovakia as technical adviser to the ministry of public health and physical education.

MINNESOTA

Personal.—On March 12, the Mayo Foundation was addressed by Dr. James Ewing, President Vincent and Dr. Charles Choyce.——Dr. Royal N. Chapman, assistant professor of entomology of the University of Minnesota, delivered a lecture, March 15, before an open meeting of the Mayo Foundation Alumni Chapter of Sigma Xi.

Refuses to Obey State Board's Order.—To enable Minneapolis' babies to have raw milk, Dr. Francis E. Harrington, Minneapolis, health commissioner, has announced that the health department will disregard the order of the state live-stock sanitary board and will furnish veterinarians with tuberculin for testing dairy cows. According to Dr. Harrington, the state order was issued because the state had no funds to reimburse herd owners for infected cattle condemned as a result of tuberculin tests. The order of the state board does not apply to cattle for interstate shipment.

MONTANA

Personal.—At the regular March meeting of the Cascade County Medical Society, held at Great Falls, Dr. Charles E. K. Vidal, superintendent of the tuberculosis sanatorium at Galen, gave an address on work with tuberculous patients.

House Concurs in Siegfriedt Bill.—Despite objections, and after several amendments had been made, the house concurred in the Siegfreidt Bill, S. B. 289, which permits the issuance by physicians of whisky prescriptions under the regulations of the Volstead act.

NEW JERSEY

Midwife Loses License.—The New Jersey Board of Medical Examiners reports that it has revoked the license to practice midwifery of Ida Campagna Quadara on the charge of criminal abortion.

Illegal Practitioners Fined.—It is reported that Norbert F. Capek was convicted, on January 10, of practicing medicine without a license and fined $200 and costs; and on March 10, Mary Ann Maniar of New Brunswick was fined $200 for practicing medicine without a license.

Physicians' Licenses Revoked.—The New Jersey Board of Medical Examiners reports that on Feb. 15, 1921, it revoked the licenses to practice medicine and surgery of Dr. Alfred C. Pedrick, Passaic, and of Dr. Louis S. Blumberg, Newark. Both physicians were charged with criminal abortion. Dr. Blumberg has appealed from the decision of the board and his case is now before the supreme court.

Preventive Health Work.—Child hygiene work is being carried on extensively in all parts of New Jersey under the supervision of the state department of health. In 1920, seventy-nine child hygiene nurses made 105,437 visits to approximately 12,000 babies and 2,000 expectant mothers, exercising at the same time supervision over the children of preschool age, detecting and having corrected many defects

and deformities. The nurses in their visits have discovered 214 late reported births and 282 unreported births, thus materially helping complete birth registration. Two hundred and eighty-five cases of bad housing and insanitary conditions were discovered and reported by the nurses to the proper authorities. They have also helped in the checking of contagious diseases having reported 279 cases discovered in their home visits. Special efforts have been taken toward the prevention of blindness by taking eye smears in suspicious cases. This work has been made possible by an appropriation of $150,000 for child hygiene activities, the largest amount appropriated by any state in the Union.

NEW YORK

State Legislation.—A bill has been introduced in the state legislature to provide adequate and scientific medical and surgical treatment for residents and industrial workers in rural districts of the state. The measure seeks to authorize a county or city to create one or more health centers and to provide state aid. The bill carries an appropriation of $25,000.

Utica to Have Health Department.—As a result of the recent investigation by the joint legislative committee on taxation and retrenchment, a bill has been introduced which will permit Utica—as well as other cities of the second and third class—to have a health department under a commissioner of health. Utica, at present, operates under a health officer who reports to the commissioner of public safety.

New York City

Personal.—Miss Winifred Holt, founder of the Lighthouse, an educational center for the blind, has been presented with a gold medal in behalf of King Victor Emmanuel of Italy in recognition of her work among the blind of Italy during the war.

Camp Merritt Base Hospital Officers Association.—The association will hold its second annual meeting at the New York Athletic Club, 58 West Fifty-Ninth Street, April 9. The meeting will be at 6:30 and dinner will be served at 7:30.

Harvey Lecture.—Dr. F. Gowland Hopkins, professor of biochemistry in the University of Cambridge, will deliver the ninth of the current series of Harvey Society lectures at the New York Academy of Medicine, April 2, on the subject of "The Chemical Dynamics of Muscle."

Van Cortland Hospital Reopened.—This institution, which is an annex to Montefiore Home and was operated by the government for the care of wounded officers, has been reopened as a rest house for patients able to pay and who wish to take advantage of its outdoor situation.

Influenza Makes Steady Gain.—Though not reaching epidemic proportions, influenza has been steadily increasing in this city since January 1. From January 1 until March 14, there were 1,038 cases and 120 deaths reported. At the present time a larger number of cases of influenza are being reported to the health department daily than at any time during the winter.

NORTH CAROLINA

Physicians Appointed by the Governor.—Governor Morrison has appointed North Carolina physicians to membership on governing boards as follows: State Hospital for Insane at Raleigh, Dr. Leslie B. Evans, Bertie County, four years; State Hospital for Insane at Goldsboro (colored patients only), Dr. John D. Robinson, Duplin County, two years, Dr. H. V. Horton, Forsythe County, four years; State Hospital for Insane, Raleigh, Dr. Guy S. Kirby, McDowell County, two years, Dr. John M. Belk, Union County, four years; State School for Blind, Raleigh, Dr. Wiley A. Rogers, Macon County, six years; Caswell School for Feebleminded, Kinston, Dr. M. R. Stephenson, Northampton County, four years, Dr. Isaac W. Faison, Mecklenburg County, six years.

Hospital News.—The will of the late George W. Watts, Durham, provides an additional bequest of $200,000 to Watts Hospital, Durham. This bequest with his former benefactions to the institution, founded by him and bearing his name, exceed $1,000,000.——Public meetings have been recently held to formulate plans for the erection of a general hospital for Greensboro, to cost $300,000.——At Asheville plans are being perfected for the construction of the fourth hospital in the state exclusively for negroes, which is expected to care for twenty patients. Churches of the city will take special offerings, March 20. It is expected to open the place in a few months.——A drive is now on in Moore County to complete the erection of and to erase the debt on the McConnell Memorial Hospital at the Farm Life School recently built in memory of James McConnell, an American aviator from this county, who lost his life in service with the escadrille in 1918.

OHIO

The Cincinnati College of Surgeons.—The Cincinnati College of Surgeons was organized, February 22. Membership is restricted to residents of Cincinnati and its environs. The officers are: president, Archibald I. Carson; president-elect, Charles L. Bonifield; treasurer, Goodrich B. Rhodes; secretary, Charles T. Souther.

Seventy-Fifth Anniversary of State Association.—The state medical association will hold its seventy-fifth annual meeting, May 3-5, at Columbus. Dr. Joseph R. Eastman, University of Indiana School of Medicine, will deliver an address on "Surgery" and Dr. Reuben Peterson, University of Michigan, on "Obstetrics." Lieut.-Col. Henry Smith, India, will deliver a special address before the eye, ear, nose and throat section on "Ophthalmology," and he will also hold an eye clinic at one of the hospitals on the second day of the meeting.

PENNSYLVANIA

Philadelphia

Personal.—Prof. E. Newton of Princeton University addressed the Physiological Society, March 21, on the subject, "Bioluminescence."——Dr. George A. Knowles has been reappointed a trustee of the state hospital at Norristown.

Officers Elected.—The Philadelphia Academy of Medicine and Allied Sciences elected the following officers: president, Thomas Spotuas Burwell; vice president, DeHaven Hinkson; treasurer, I. M. Lawrence; recording secretary, C. Eugene Allen, and corresponding secretary, John P. Turner.

To Extend Health Law.—A measure to extend the jurisdiction and supervision of the Department of Public Health of Philadelphia was introduced in the House by Representative Harry J. Trainer. The measure was proposed by Dr. Charles L. Furbush, health director in Philadelphia. The Philadelphia Board of Health, in one bill, is directed to make rules and regulations for the sanitary conduct of the business of preparing, exposing and offering for sale articles of food. The bill creates in the department of health the division of food inspection, which is to be made up by a consolidation of the division of meat and cattle inspection and the division of milk inspection in the department.

TEXAS

Physicians Plan State Meeting.—Committees of Dallas physicians are arranging a program for the meeting of the Texas State Medical Society to be held at Dallas, May 10-12. Lieut.-Col. Henry Smith, London, formerly of the British Government India Medical Service, is expected to attend the convention.

State Legislation.—A bill has been introduced in the house authorizing the board of health to prevent the use of materials which have been subjected to infectious disease in making and remaking marketable products. The measure imposes a fine of from $25 to $500 or six months in jail—or both fine and imprisonment—for violation of the provisions of the proposed law.

Negro Health Week.—For the third time the Texas Public Health Association is announcing its cooperation with all of the states having a large negro population, in the National Negro Health Week, April 3-9. The purposes of Negro Health Week are to educate the people of that race in the methods of preventing disease and in the improving of local sanitary conditions. A special program for each of the days of the week has been prepared. The Negro Health Week is held at approximately the same time each year. Last year over 200,000 negroes of Texas participated in some form or other in the celebration of this week. Any one interested in having an active part in Negro Health Week can secure full information by writing Dwight E. Breed, Executive Secretary, Texas Public Health Association, 616 Littlefield Building, Austin.

WEST VIRGINIA

Personal.—At the last meeting of the Kanawha Medical Society held, March 15, at Charleston, a gold watch was presented to Dr. Samuel L. Jepson, who recently retired from the state health commission as a token of the esteem in which he is held by the local medical fraternity. The presentation was made by Dr. Floyd F. Farnsworth.

CANADA

Personal.—Dr. Charles S. McVicar, recently in command of the Toronto (Military) Orthopoedic Hospital, is now at the Mayo Clinic and may remain there for some time.——Dr. Charles J. Hastings, M. O. H., Toronto, who has been in Florida for some time, has returned.

Hospital News.—A new hospital for the east end of Toronto will soon be erected. It will accommodate 250 patients. The site will be purchased during the present year, and one unit of the hospital will be built this year.——The new Reception Hospital for Toronto is to cost $400,000 and will be erected within a short distance of the General Hospital.

Society News.—The Niagara District Medical Association met last on January 26. Dr. James F. Rice, Buffalo, was present and read a paper on "Thyroid Therapy."——The North Waterloo Medical Society met at Kitchener, Ont., in January. Dr. Norman B. Gwyn, Toronto, read a paper on "Encephalitis Lethargica."——The Lambton County Medical Society met in February at Wyoming. The officers elected are: president, Dr. Charles W. Sawers, Wyoming; vice president, Dr. George H. R. Hamilton, Petrolia; secretary-treasurer, Dr. Charles H. Smith, Petrolia.——The South Waterloo Medical Society met in February at Galt. Dr. John A. Oille, Toronto, conducted a clinic on a number of cases of disease of the heart.——At the last meeting of the Alberta Medical Association, Dr. William F. Gershaw, Medicine Hat, the president, paid a tribute to the memory of the late Dr. James D. Lafferty, Calgary, one of the pioneers in medicine in Alberta—a man of high ideals, a good physician, and a good citizen.——The Ontario Medical Association seeks to have a medical man appointed a member of the board of commissioners of the workman's compensation.

GENERAL

Federation of State Medical Boards Elects Officers.—At its annual meeting held in Chicago, March 8, the Federation of State Medical Boards of the United States elected its officers as follows: president, Dr. David A. Strickler, Denver; vice president, Dr. K. C. P. Bonner, Morehead City, N. C.; secretary-treasurer, Dr. Walter L. Bierring, Des Moines, Iowa, and for member of the executive committee, Dr. Byron U. Richards, Providence, R. I.

Palmer Ruling on Alcohol Prescriptions to Stand.—Definite announcement that former Attorney-General Palmer's opinion permitting physicians to prescribe beer for medical purposes would continue to remain in force under the Harding administration has been made by Attorney-General Daugherty. He stated that he had no intention of revising the opinion of his predecessor. It is understood that regulations carrying out Mr. Palmer's opinion that beer may be prescribed by physicians as a medicine will be left to the new Commissioner of Internal Revenues. The present commissioner states that the full effect of the opinion cannot at this time be determined.

Personal.—Dr. Haven Emerson, formerly commissioner of health of New York City, has been appointed to the position of medical adviser and assistant director of the Bureau of War Risk Insurance.——Sir Norman Moore, London, president of the Royal College of Physicians, has appointed Dr. Herbert R. Spencer, London, to deliver the Harveian oration in October, and Dr. Michael C. Grabham, Madeira, to deliver the Bradshaw lecture in November. Dr. Major Greenwood, London, will deliver the Milroy lectures in 1922.——At a recent meeting of the University of Kansas, Chapter of Sigma Xi, Dr. Arthur F. Coca of the Cornell University Medical School, editor of the *Journal of Immunology*, gave an address on "Hypersensitiveness" Dr Coca has been recently studying the hypersensitiveness of Indian students at Haskell Institute, Lawrence, Kan.——Dr. Carl L. Alsberg, chief of the Bureau of Chemistry of the U. S. Department of Agriculture, has been appointed director of the Food Research Institute which is to be established at Stanford University by the Carnegie Corporation. He will assume his new work on July 1.

LATIN AMERICA

Chutro in Madrid.—Dr. Pedro Chutro, professor of clinical surgery of the medical school of Buenos Aires, well known in this country, is now at Madrid, Spain, where he has given several lectures.

Agitation for Secretary of Public Health in Chile.—The *Revista Médica de Chile* reproduces the arguments recently presented at a conference at Santiago urging the necessity for the foundation or creation of a department in the national government to coordinate the public health work and extend it. The same number gives also the statutes of the Chilean League for Social Hygiene and the report it recently presented to the war department which had requested advice on plans for social hygiene during mobilization in the province of Tacna.

Personal.—Dr. José Jorge Callejas of Honduras has returned after a trip to the United States.——Dr. Julio Aspuru España, editor of the *Revista Médica* of Tegucigalpa, Honduras, has been appointed professor of the medical school of Nicaragua.——Dr. Luis M. DeBayle of Léon, Nicaragua, who has been for some time at the Mayo Clinic, is planning to return to his country.——Dr. A. Scroggie Vergara was appointed to the fellowship offered to a young Chilean physician by the Chilean-American Association which has headquarters in New York. The fellowship provides for a year of study at the New York Post-Graduate Medical School and Hospital, as was recently mentioned, page 531.

Bill to Regulate Medical Advertising in Uruguay.—The *Boletin* of the national public health service contains the bill presented in the Uruguay legislature by the senator from Florida, Dr. A. Gallinal. It was referred to the Consejo Nacional de Higiene for advice, and the Consejo endorses it most decidedly, giving ample reasons therefor. The bill would prohibit all medical or pharmaceutical advertising by nonmedical persons, and all exaggerated claims by medical and allied persons. It would prohibit also the importation of nostrums and the sale or exhibition by pharmacists of any remedies claimed to treat certain symptoms or diseases. The Consejo Nacional de Higiene is given full power in the bill to pass judgment on the remedies, etc., offered and on the various questions as they arise in connection with the enforcement of the bill. It limits to a simple notice of name and address the advertisements of midwives. Penalties of from 100 to 1,000 pesos are imposed, or equivalent prison terms.

FOREIGN

Smallpox in Spain.—There has just occurred a severe outbreak at Mequinenza, Zaragoza, with several deaths and another at Adra, Almería.

Foot-and-Mouth Disease in Spain.—Spanish authorities have admitted officially the presence of foot-and-mouth disease in Fuentes de Jiloca and in Daroca, Zaragoza.

Personal.—The University of Cambridge has awarded its doctorate of laws to Sir Patrick Manson of the London School of Tropical Medicine and Dr. Albert Calmette of the Paris Pasteur Institute.

National Bureau of Mouth Hygiene.—New Zealand has established a national bureau of mouth hygiene with a director and staff assistants who will care for the mouths of all schoolchildren at government expense.

Congress of Radiology and Physiotherapy.—The Electrotherapeutic Section of the Royal Society of Medicine and the British Association of Radiology and Physiotherapy have organized a congress to be held in London, April 14-16.

American Students in Italy.—The *Policlinico* relates that the Italian-American Society is planning to send 250 American university students to Italy this summer vacation for a brief visit to scientific institutions and industrial establishments.

Street Renamed in Memory of Physician.—The city of Bordeaux has officially changed the name of the street on which the late Professor Demons resided to *rue du Docteur-Demons* as a tribute to his memory. He was professor of surgery until his retirement in 1911 and died in July, 1920.

Medicolegal Congress.—The *Liége médical* gives the details in regard to the Sixth Congress on Legal Medicine of French Speaking Countries. It is to be held at Brussels, May 23 and 24, and then will adjourn to Liége for the two following days. Professor Héger-Gilbert will preside at Brussels and Professor Stockis at Liége. The official organ of these congresses is the *Annales de médecine légale*, which is sent to all subscribers to the congress; the fee is 50 francs for members. The main topics to be discussed are penitentiary anthropology and psychiatry; the Code and the abnormal; identification of alkaloids by spectrography; mechanical asphyxia; traumatic shock, and hydrocyanic acid poisoning. The treasurer's address is Dr. De Laet, 66 rue de Livourne, Bruxelles.

Requirements for Admission of Foreign Student to German Universities.—Until recently a candidate for admission to a German university merely sent in his application a month before the opening of the term. The rules have been changed now, according to the *Deutsche medizinische Wochenschrift*

of Feb. 3, 1921, p. 137. The candidate has to apply for permission to enter the country, and present credentials showing educational equivalents to the grade desired; also evidence that he has sufficient knowledge of the German language; also a description written by himself of his previous career, and, finally, evidence that the student has sufficient means for his support and work. The acceptance of the candidate depends on whether there is room in the institution of learning selected, and further on whether there is reciprocity with the candidate's home state.

Twenty-Fifth Anniversary of Medical School for Natives.—The first medical school for natives in the French colonies was founded at Tananarive on the island of Madagascar in 1896. The school has conferred the medical degree on 336 graduates but fifty-six of these belonged to a previous régime. The school has also conferred the title of midwife on 208 native women. The epidemic of influenza in 1919 caused 100,000 deaths in the island, including a number of native physicians. When the World War broke out, many native physicians offered their services to France and thirteen were placed as assistant physicians in the army camps and five were appointed *médecins aides-majors*. Their devotion to the care of the wounded won the *médaille militaire* for one of them, and two others were cited for especial gallantry. Dr. Fontoynont has long been the dean of the medical school.

Deaths in Other Countries

Dr. **L. Rossini** of Albano, Italy, aiding the victims of a night railroad accident, succumbed to heart disease aggravated by the cold and exertion.——Dr. **E. Béranock,** professor of biology at the University of Neuchâtel, Switzerland, aged 61, author of numerous works on bacteriology and biology, and inventor of the method of extracting the endotoxin of the tubercle bacillus to aid in preparation of tuberculin.——The cable brings word of the death of Dr. **León Becerra,** chief health officer of Guayaquil, Ecuador, a member of the Rockefeller commission studying the yellow fever situation. His death was the result of injuries in a street car accident.——Dr. **J. Rohmer,** professor of ophthalmology at the University of Nancy.——Dr. **F. Selberg,** a leader in the organization of the profession in Berlin, aged 78.——Dr. **M. Thiemich,** professor of children's diseases at the University of Leipzig, aged 51.——Dr. **S. Ribbing,** formerly professor of internal medicine at the University of Lund, aged 76.

Death of Dr. Semon.—Sir Felix Semon, K.C.V.O., M.D., F.R.C.P., died March 1 at Rignalls, Great Missenden, England, at the age of 72 years. In accordance with the expressed wish of Sir Felix, the body was cremated. He was born at Danzig in 1849 and began his medical studies at Heidelberg in 1868. During the Franco-Prussian War he served as a volunteer with the Prussian Guard. The war over he resumed his medical studies and took the M.D. degree at Berlin in 1873, and the German Staats Examen in the following year. He then studied in Vienna and Paris, devoting his attention more particularly to diseases of the throat and nose, and becoming expert in the use of the laryngoscope, then recently introduced into medicine. He decided to settle in England, acted as clinical assistant at the Throat Hospital in Golden Square in 1875, was admitted a member of the Royal College of Physicians in 1876, and was elected F.R.C.P. in 1885. In 1894 the German emperor conferred on him the title of Royal Prussian Professor, the Order of the Red Eagle having been given him in 1888. In 1893 he was one of the founders of the Laryngological Society—now merged in the Royal Society of Medicine—and was elected president for the years 1894-1896. At the Diamond Jubilee in 1897 he received the honor of knighthood, and in 1902 he was decorated C.V.O., being advanced to K.C.V.O. in 1905. In 1897 he resigned his appointment at St. Thomas' Hospital owing to the increase in his private practice, and in 1901 he was appointed Physician Extraordinary to King Edward VII. Dr. Semon continued to enjoy a large laryngologic practice until 1911, when he retired. British laryngologists and many of his foreign confrères then collected a sum of £1,040 as a testimonial to the esteem in which he was held. This sum he presented to the University of London to establish "The Semon Lecture Fund" for the purpose of awarding a commemorative bronze medal for the best work in the treatment of diseases of the throat and nose, and to found a lectureship to be called the "Semon Lectureship in Laryngology." In 1884 he founded the *Internationales Centralblatt fuer Laryngologie und Rhinologie*, and for twenty-five years he acted as its editor. His chief work was in connection with cancer of the throat and with the functions and diseases of the motor nerves of the larynx.

Government Services

Establish Reserve Corps Course

Announcement was made by Surgeon-General Ireland that the medical school of the University of Oregon at Portland will establish a reserve officers corps unit. The course will not be inaugurated until next September. Lieut.-Col. Frank Baker, U. S. Medical Corps, has been appointed as professor of military science and tactics at the University of Oregon and will conduct the reserve officers' school there.

Surgeon-General Inspects Hospital

Surgeon-General Ireland after a formal inspection of the new hospital constructed at the Soldier's Home in Washington, D. C., has accepted it from the contractors. The structure is a magnificent one. The Soldiers' Home is managed by a board of directors composed of the Surgeon-General, the Adjutant-General, the Quartermaster-General and the Inspector-General of the Army.

Quarantine Station at Norfolk

The U. S. Public Health Service is expected shortly to increase its force of officers on duty at the new quarantine station at Norfolk, Va., because of the increased number of immigrants coming into that port. The Hamburg-American Steamship Line which has been landing immigrants to the United States at New York has decided to use the Norfolk harbor in order to avoid congestion and delay. The quarantine station at Norfolk is on Craney Island and is one of the finest on the Atlantic Coast. It was completed last year and cost $1,000,000.

Dr. Sawyer Assumes New Duties

Dr. Charles E. Sawyer, the President's physician, is making a general study of the medical and welfare activities of the governments. Dr. Sawyer has been given direct authority by the President to investigate these subjects and to present the accumulated facts. It is reported that the President proposes to establish during his administration an executive department to be called the Department of Public Welfare. Dr. Sawyer's headquarters are Room 244 of the State, War and Navy Building, Washington, D. C.

Regulations Concerning the Reserve Officers' Corps Will Be Published

The regulations covering the Reserve Officers' Corps of the Army will shortly be made public, having been completed by the board of officers equally representing the Regular Army and the reserve corps. The regulations cover the policies and rules affecting the organization, distribution and training of National Guard and organized reserves and all policies and regulations affecting the appointment, assignment, promotion and discharge of reserve officers. The board, which was appointed last year, has spent over eight months working on the regulations, having made trips to various Army camps to secure the opinions of regular as well as reserve officers.

Committee Appointed to Select Hospital Sites

Appointment of a committee of physicians, to survey the country for the purpose of selecting the most advantageous sites and locating the soldier rehabilitation hospitals provided for by recent legislation, has been announced by Secretary of the Treasury Mellon. The members include: Drs. Pearce Bailey, New York; Frank Billings, Chicago; Chancellor W. G. Bowman and Dr. William C. White, Pittsburgh, chairman. The duty of this committee is to recommend to Secretary Mellon the sites for the new hospitals to be constructed by the government and operated under the Bureau of War Risk Insurance. The sum to be expended will be $12,500,000. Secretary Mellon has already received more than 200 applications from various parts of the country making request for the location of these hospitals. The headquarters have been established in the Butler Building, Washington, D. C. The members of the committee are now in Washington, and are holding conferences with departmental heads, including the War Risk Bureau, the U. S. Public Health Service and Assistant Secretary of the Treasury, Ewing LaPorte, to ascertain the facts with reference to hospital requirements, in possession of these departments.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 1, 1921.

A Means of Obtaining the Collective Opinion of the Profession

The minister of health made a request to a deputation of the British Medical Association that he be provided with a body really representative of the whole profession, which he could consult on questions of policy, instead of being approached by half a dozen bodies, each claiming to represent the profession. The association accordingly invited certain medical bodies to cooperate with it in constituting such a body, and has thus stated its views: 1. The body must represent the views of the medical profession and the medical profession alone. The minister has asked for such a body. When he wishes for the views of the dental, pharmaceutic or nursing professions, he will naturally call on organizations representing these professions. 2. The body must be an immediately and directly responsible body—that is to say, it must recognize the authority of its constituents and no other authority. It must be under the constitutional control of the whole of its constituents without undue bias toward any one section. A body which the bulk of the profession felt they had no direct means of controlling would be worse than useless for the purpose of the minister, and might do great damage to the interests of the profession. 3. The body must be really representative. That is to say, it must have modern constitutional methods of ascertaining the opinion of its constituents and securing their acceptance of agreements made on their behalf. 4. The constituents of the body must be directly and immediately concerned with medical politics, and trained in the expression on such matters. Bodies exclusively or mainly scientific have no concern with medical politics and have no machinery for dealing with such matters. 5. The body must not profess to promote the interests of the community rather than those of physicians. Physicians are also citizens, but what the minister requires is a body which will tell him what physicians as physicians think, whether as to the interests of their profession or as to questions of public health.

The British Medical Association considers that, acting alone, it would be justified in claiming the qualifications enumerated. It contains 52 per cent. of the profession. If those who are not practicing and what may be called "floating medical population" be eliminated, then it contains 60 per cent. of the active members of the profession. It is really representative of its members and has well-tried machinery for ascertaining their views. Moreover, it is recognized informally by large numbers of physicians who do not belong to it as the body which voices the wishes and sentiments of the profession as a whole. In order to make itself as useful as possible to all sections of the profession, the association has always tried to work with organized bodies representing distinct sections. Representatives of the Society of Health Officers, the Medical Women's Federation, the Poor Law Medical Officers' Association and the Medico-Psychological Association have frequently sat on committees of the association. The Insurance Acts Committee of the association in a very special way represents the interests of the 14,000 physicians engaged in national health insurance work. A majority of the committee consists of members elected directly by the local medical panel committees with no restriction as to whether members of the association or not. The association therefore feels that if, as it expects, it secures the cooperation of the societies named above, it will be able to offer the minister a body which (with the exception of the body next to be mentioned) is representative of all the organized medical profession, both generally and sectionally. The exception referred to is that of the Royal College of Physicians of London and the Royal College of Surgeons of England. The association recognizes that these are able to speak for the consultant section of the profession in a way which is not open even to the British Medical Association. The association has intimated to them that their cooperation in the matter under consideration would be greatly valued.

It is noteworthy that one important body—the Medico-Political Union—is not mentioned by the association. This consists of about 3,000 physicians, and is registered as a trade union. It believes that the interests of the profession can be effectually promoted only by trade unionism, and has attacked the British Medical Association and criticized its methods as weak. Attempts at cooperation between the two bodies have taken place, for they profess the same objects and many physicians are members of both, but evidently hostility predominates. There is another body, the Federation of Medical and Allied Societies (dental, pharmaceutic, etc.) which, as described in previous letters to THE JOURNAL, was formed for the purpose of federating all medical societies into a body representative of the whole profession, the very thing asked for by the minister. Its efforts have not been regarded with much favor by the British Medical Association. It recently invited a conference with a view to discussing cooperation on the lines suggested by the minister, and invited the British Medical Association. But the latter declined, saying that it was itself engaged in the same task. The federation makes one claim, which the British Medical Association evidently does not—ability to give the government advice on medical matters from the standpoint of the public interest without any professional bias.

Epidemic Encephalitis

Epidemic or lethargic encephalitis is present in this country. One hundred and thirty-six patients are under treatment, and twenty-two fresh cases have been notified in a week. There are twenty-two in London. The numbers are too small for the disease to be described as epidemic. So far no deaths have occurred.

The Extravagance of the Pensions Ministry

One thing for which the present government is becoming notorious, in spite of the crushing burden of the war on the taxpayer, is extravagance. This fact is beginning to be grasped by even the dullest of its supporters. Sir John Collie, formerly principal director of medical services of the ministry of pensions, defends with tenacity against the rejoinder of the ministry his charge of extravagance, reported in a previous letter to THE JOURNAL. One-man boards should take the place of three-men boards in dealing with routine examinations, for which one fifth of the whole medical profession is now employed. When he was director, he had examinations of neurasthenics conducted by one good man on the understanding that he was entitled to the assistance of colleagues examining in different parts of the same hall. This system worked for a year without a single complaint. All his friends now sitting on medical boards are unanimous in condemnation of three men sitting on a board. He was told that during a sitting each member noted separately in each case the degree of disability. The findings of the examiners agreed, except that in one instance his informant had reported 10 per cent. more disability than his colleagues; but he attributed this to the fact that it was his first day on the board. The present system of paying pensions for small disabilities to men in employment is disastrous. No wonder that the sum paid for pensions last year amounted to $590,000,000. A lump sum should be paid in such cases. Of

eighty such persons drawing pensions of from $1 to $5 a week whom Sir John passed as not fit for work, not one has broken down. Surely it was never intended that able-bodied men should draw these doles. From what he knows of such cases he is sure that a lump sum would gladly have been accepted, which would have saved administrative expenses.

Baby Killed by a Rat

An inquest has been held on a child, aged 3 months, who was left sleeping by her mother in the living room at the east end of London. On returning she saw a large rat jump away from the child, who was bitten in two places at the back of the neck. Death from septic poisoning followed. Such a gruesome tragedy must be very uncommon. The only analogous case in this country which I can recall occurred some years ago. Ferrets broke loose from a cage and killed an infant who had been left in charge of a young child while the parents were out.

PARIS

(From Our Regular Correspondent)

March 4, 1921.

Appreciation of Articles on Biologic Therapy

Dr. L. Cheinisse, editor of the "Mouvement Thérapeutique" in the *Presse médicale*, refers in a recent number to the series of articles on biologic therapy that appeared not long ago in THE JOURNAL. In this connection he calls the attention of French readers to the rôle played by the American Medical Association and the Council on Pharmacy and Chemistry in the campaign against abuses and frauds in the matter of pharmaceutic products.

Archives of General and Experimental Morphology

Under the scientific direction of Professors Anthony and Prenant, Paris; Bataillon and Bouin, Strasbourg, and Latarjet and Policard, Lyons, the publishing house of Octave Doin has undertaken the publication of the *Archives de morphologie générale et expérimentale*. The Archives will publish at irregular intervals, and without subscription, original articles by French writers (or at least written in the French language) on anatomy, histology, embryology and experimental morphology. Each article will be published in full in the form of a separate monograph of octavo size and will be sold at a price varying with its importance and the character of its illustrations.

Abandoned Children in Paris

The number of children turned over to the hands of public charity organizations is decreasing. The maximal number of children abandoned in Paris was reached in 1898; namely, 5,200. In 1904 the number decreased to 4,800. Since then the record has been: 1905, 4,350; 1910, 3,525; 1915, 2,750; 1916, 2,950; 1917, 2,300; 1918, 3,150, and 1919, 3,675. For 1920, up to November, 3,090 entries are recorded.

Prizes for Large Families

The General Council of the Department of the Seine has instituted prizes for large families. These prizes are accorded to the mothers of legitimate children and of recognized illegitimate children. The mothers must have resided for three years in a commune of the department and must have given birth to at least two living children. For the third child 300 francs are bestowed; 350 francs for the fourth, 400 francs for the fifth, and so on, there being a progressive increase of 50 francs for each additional child. These prizes are payable in two instalments—150 francs on the thirtieth day after birth, and the balance when the child is 1 year old. Monsieur Latour, the reporter of the budget, pointed out that this act would entail a heavy expense for the department and requested the council to pass a resolution asking the administration to levy a municipal tax on bachelors. The funds thus secured would permit the city to meet the increased obligations incurred by this endeavor to raise the birth rate.

Infant Welfare

At the request of Monsieur Granger, the municipal council of Paris has granted an appropriation of 50,000 francs, for the first six months of 1921, in aid of the Franco-American infant welfare movement.

Gift of Mme. Mathias Duval to the Paris Faculty of Medicine

The Council of the Paris Faculty of Medicine, at its last meeting, accepted a gift of 50,000 francs from Mme. Mathias Duval, widow of the eminent professor of histology. The sum is given without any conditions as to the manner in which it shall be expended. A committee has been appointed to decide how the sum can best be employed.

Attendance at the University of Paris

This is the record of attendance in the various departments of the University of Paris for the period from 1905 to 1921:

	1905-06	1906-07	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13
Law	5,708	6,392	6,911	7,135	6,751	6,683	6,560	6,501
Medicine	2,825	2,794	3,040	2,902	3,124	3,252	2,251	3,291
Sciences	1,388	1,494	1,370	1,346	1,285	1,138	1,150	1,119
Belles-lettres	1,251	1,537	1,377	1,298	1,354	1,325	1,314	1,322
Pharmacy	1 029	882	789	753	719	620	640	570
Totals	12,181	13,099	13,487	13,434	13,233	13,018	12,921	12,503

	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21
Law	6,657	866	1,227	1,311	1,614	3,080	5,798	3,332
Medicine	3,245	636	788	866	1,433	2,136	3,511	1,522
Sciences	1,175	358	432	529	611	1,040	1,969	1,558
Belles-lettres	1,377	372	439	442	434	780	1,247	967
Pharmacy	502	121	173	197	292	315	536	315
Totals	12,946	2,385	3,159	3,345	4,384	7,350	13,071	7,694

There is only one department that has not fallen off; namely, the department of science, which is, in fact, higher than the prewar standard. The department of pharmacy continues to decline; but this movement was noticed long before the beginning of the war, and is due to the fact that there are too many pharmacists in France. The department of belles-lettres has fallen off considerably. The law department has declined 50 per cent. and the medical department more than 50 per cent. It is probable that these conditions are due in the main to the abnormal financial situation. The various departments have witnessed a decline in a direct ratio with the length of their courses. The department of science has increased because the diploma of a civil engineer is soon acquired and a remunerative position soon secured. Medicine, on the contrary, requires a minimum of seven years of study, and the first years of practice often necessitate an additional income from other sources, which fact must also be considered.

The Fifteenth French Congress of Medicine

This congress will be held in Strasbourg from Oct. 3-5, 1921, under the chairmanship of Dr. Bard, professor of clinical medicine in the University of Strasbourg. These are the subjects to be discussed: (1) the anatomic and functional adaptation of the heart to pathologic conditions of the circulation; papers by (Mademoiselle) Dr. Cottin of Strasbourg and Dr. Demeyer of Brussels; (2) glycemia; papers by Professor Ambard, Strasbourg; Dr. Chabanier, Paris, and Dr. Baudoin, Paris, and (3) antianaphylaxis; papers by Professor Widal, Paris; Drs. Abrami and Pasteur-Vallery-Radot, Paris, and Dr. Péhu, Lyons. Information in regard to the congress may be secured from the general secretary, Prof. Léon Blum, à la clinique médicale B, Strasbourg, France.

BELGIUM

(From Our Regular Correspondent)

Feb. 15, 1921.

Medical Inspection of Schools

Evidence that we are living in an age of reforms in social medicine continues to accumulate. More and more our legislators are showing their interest in the amelioration of conditions pertaining to professional, industrial and social hygiene. At the foundation of any system of hygiene must be placed all the movements set on foot to protect the health of childhood. The schools must be closely inspected, and it is for this reason that in response to a request from the ministry of arts and sciences the Fédération médicale belge has drawn up a series of desiderata concerning the medical inspection of schools. The program proposed by the federation is summed up in nine special suggestions or demands:

1. The medical inspection of schools should include the study of the architectural plans, the general hygiene of the schools and the individual examination of the pupils.
2. A card index of the pupils should be kept, and the medical portion of the information should be collected and edited in such a manner as to prevent the violation of medical secrecy and any interference with the interests of the family physician.
3. School health administration constitutes a service by itself and has no connection whatsoever with public charity services.
4. The medical inspector will in no case give any medical attention or institute any method of treatment, as medical inspection is carried out solely on the basis of prevention and precaution.
5. Specialists (ophthalmologists, otolaryngologists, dentists, etc.) should be charged with the examination of children referred by the medical inspectors, and should receive special remuneration.
6. The number of children constituting the assignment of a medical inspector should never exceed 500.
7. Medical inspectors of schools shall be remunerated on the basis of 3 francs per pupil.
8. A special remuneration shall be accorded medical inspectors employed by the government or the school management to make visits, reports, etc., in connection with general inspection, hygienic conditions, or any mission not having for its direct object the individual examination of the pupils. The remuneration for such visits shall be fixed at 15 francs per visit, and a mileage allowance of 1 franc per kilometer shall be made (for both coming and going) in case the distance traversed exceeds 3 kilometers.
9. Physicians who are invested with communal authority may be appointed medical inspectors of schools. This is in the interest of public policy, for in the majority of the communes the physicians (or the physician) are members of the communal council, and consequently the law would be difficult to apply. Furthermore, it would often happen that strict application of the law would prevent the commune from getting the benefit of the knowledge and experience of those physicians who have occupied themselves most with questions of hygiene.

The Brisseau Memorial

At its spring session, the Société belge d'ophthalmologie adopted a resolution presented by Messieurs Van Duyse and De Mets looking toward the erection of a memorial to Brisseau, the famous demonstrator of the nature of cataract. The Belgian committee to which the matter was referred has secured the support of the Société française d'ophthalmologie, which has delegated Messieurs Lapersonne and Terrien, and also a number of foreigners, to assist in the matter. The committee hopes to be able to erect a monument worthy of the practitioner whose name is too little known to the public and even to the medical world.

Pyelography with Potassium Iodid

Before the Société belge d'urologie, Dr. Beyer demonstrated recently the method of procedure in giving injections of collargol, oily substances and thorium nitrate. In conjunction with Dr. Denobele, he has tried out various substances, all of which are harmless and may be used as contrast mediums: a 3 per cent. solution of silver nitrate, a 10 per cent. solution of strontium bromid, a 12 per cent. solution of calcium bromid and a 12 per cent. solution of potassium iodid. The last solution is the least toxic and the most easily prepared; it is absolutely harmless. In the discussion that followed this communication, Dr. Le Clerc-Dandoy stated that, following the example of Dr. Papin (Paris), he used a 30 per cent. solution of sodium bromid, combined with a small quantity of mercuric oxycyanid. Care must be taken to inject the solution very slowly, and a very small urethral catheter should be used so as to allow the back-flow of the solution.

Dr. François mentioned that the Baltimore school had raised a cry of alarm and had recommended a 20 per cent. solution of sodium bromid. Thorium may have a markedly irritative effect. François stated that he himself, following a roentgenographic examination of the bladder with thorium, was one day compelled to perform an emergency cystostomy, the patient being unable to evacuate the bladder and catheterization having become impossible.

Impressions of America and England

Dr. Réné Sand has recently published an account of his travels in England and America under the title "Notes recueillies au cours d'enquêtes successivement poursuivies aux Etats-Unis et en Angleterre" (Notes on England and the United States). Certain phases of industrial organization, social medicine and physical education in the Anglo-Saxon countries interested him to such an extent that he is endeavoring to get the public authorities in his own country to adopt them. It seems hardly indicated to develop here the contents of the various chapters of this work since the general organization of social medicine in America, which we take as our model, is well known to American physicians, but we wished merely to call attention to the work of our compatriot which pays homage to the progress made in America.

PRAGUE

(From Our Regular Correspondent)

March 1, 1921.

Return of Health Commission

The commission of the ministry of public health and physical education, consisting of six high officials in the ministry, which made a trip to the United States and England under the auspices of the Rockefeller Foundation for the study of public health administration, has returned home. A scheme for a special department of reorganization of the ministry and the entire public health service in the republic is being considered.

Typhus Fever

Scattered focal areas of typhus fever have appeared again in Slovakia and Ruthenia. It is to be expected that more cases will follow, because typhus fever in that part of the world is not a winter but a spring disease. The same thing is true about smallpox, although there is a law on compulsory vaccination in existence. It is difficult, of course, to put it into effect owing to transportation difficulties and ignorance of the population in the eastern part of the republic.

Emigration to America

The emigration from Slovakia and Ruthenia to America continues at a rate as high as 5,000 persons each month. Because there has not been efficient medical inspection of emigrants before they were given passports by the Czechoslovak authorities, a number have been turned back. The ministry of public health has conceived a plan to organize a center for all emigrants in Uherské Hradiste, where there is a large and modern delousing and quarantine plant which was built originally for the Austrian army. The plan is to have all the emigrants medically inspected before they can apply for a passport. The same standards will be used as those for medical inspection of aliens in ports of the United States. The passport will be given out only when the emigrant has passed through the plant at Uherské Hradiste. The Czechoslovak authorities would like to have an American agent sent to Uherské Hradiste to issue American visés on the passports. There would be a ticket agency at the detention station, and through cars would carry the emigrants directly to the ports of embarkation. The danger then of

spreading diseases in Europe and carrying it to the United States would thus be largely avoided.

Children's Hospital Opened

A model children's hospital has been opened at Bycica in one of the poorest districts in Slovakia. The hospital was equipped through the joint efforts of the English mission of Lady Muriel Paget and the League of Red Cross Societies. A system of child welfare clinics has been organized throughout the district connected with the hospital. The scheme is planned as a field demonstration, and it is anticipated that it will be taken over at the end of the first year by the Czech authorities. Its distinct value has already been demonstrated by the keen interest which Slovak peasants showed for the work.

BERLIN

(From Our Regular Correspondent)

March 1, 1921.

Nutrition of Children in Saxony

In accordance with a ministerial decree issued by the government of Saxony, July 1, 1920, an examination of all children from 6 to 14 years of age, including the pupils of higher institutions of learning and boarding schools, is being made in almost all the communes of Saxony. The system employed is that introduced and successfully used by the Quakers in selecting children most in need of special nutritional care. In accordance with this system the children are divided into four groups. Group 1 comprises children in a satisfactory, or at least fairly good, condition of health. Group 2 takes in the children who are slightly undernourished, for whom special nutritional care is desirable from a medical standpoint but not absolutely necessary. In Group 3 are placed children who are markedly undernourished, presenting evidence of retarded physical development (deficiency in weight and height), scrofula, late rachitis or marked anemia. Group 4 is composed of children who are in a serious condition as the result of a prolonged period of undernutrition. To this group belong all chronic patients, especially tuberculous children. The children of Groups 3 and 4 are regarded by their physicians as absolutely needing special nutritional care. In the classification of the children in the various groups the difference between the normal condition and the actual condition is the decisive factor. In order, therefore, to get a basis for the comparison as to mass and weight and thus be able to establish the deviations from normal, a table for the normal condition was worked out from the data given by Heubner. In examining into the general condition of the children, musculature, the panniculus adiposus and the mucous membranes of the children are taken carefully into account. The measurements of the children are taken, in accordance with exact directions, by teachers, welfare workers and nurses. The final opinion on the condition of the child lies, however, entirely in the hands of physicians. In this article we are considering the results of the examinations made up to November, 1920. To that date, 173,780 children had been examined in accordance with the principles outlined above, whereby it was established that 36,694 children, or 21.11 per cent., belonged to Group 1; 49,294, or 28.38 per cent., to Group 2; 58,983, or 33.94 per cent., to Group 3, and 28,809, or 16.57 per cent., to Group 4. Of the total number of children examined, 50.51 per cent. were markedly undernourished, underdeveloped physically, scrofulous, rachitic or notably anemic, or were in a serious condition due to undernutrition.

Reorganization of the Public Health Service of Greater Berlin

Now that the plans for the reorganization of the public health service as drawn up by the committee selected for that purpose have been accepted by the magistracy or city council, a new division of labor is to go into effect. Public health affairs in the new city commune are under the control of a "deputation for the public health service of the new city commune of Berlin." The chairman of the deputation is Stadtmedizinalrat Dr. Rabnow. The deputation has a central public health office and is made up of several departments with various subdivisions. Department I consists of six subdivisions: (1) the working out of general directions and questions of policy for the whole district; (2) standardization of tariff schedules, conditions of employment, assignments to service, etc., for the whole district; (3) preparation of uniform report blanks and the establishment of a uniform system of reporting; (4) collection of material for medical statistics; (5) supervision of all communal institutions in Berlin (now existing or to be established) dealing with the problem of instruction in public health service and the training of personnel, and (6) supervision of private institutions that are aided by the city commune. Department II has charge of certain institutions: (1) the Hygienic and Bacteriologic Institute, the function of which is to supervise fumigation and disinfection, vaccination and other general measures for the control of epidemics, and (2) the Chemical Institute. Department III comprises everything pertaining to social hygiene proper. Department IV deals with hospitals: (1) general hospitals; (2) special institutions (hospitals for the insane, hospitals for special diseases, retreats, sanatoriums, etc. Department V includes all forms of welfare work. Department VI, the central public health office, has charge of matters pertaining to the nutrition of the sick, the medical aspects of the welfare work for the war injured, matters pertaining to the commissioners for the poor, the so-called *Vertrauensärzte* and inspection of prescription departments. The Central Deputation has several standing committees, on (1) retreats; (2) welfare work; (3) private hospitals; (4) hospitals for the insane; (5) social hygiene, and (6) hospitals (excluding hospitals for the insane, retreats and private hospitals). The various committees administer their affairs independently, but important matters must be submitted to the Deputation. The relations between the Deputation for the Public Health Service and the several districts are regulated by common agreement. It has now been definitely established that in every outlying district a local deputation for the public health service will be created. The local deputations will have a voice in the management of the institutions located in their district. The outlying districts retain full control of the institutions that serve their local needs.

Marriages

ORION CHESTER D. JONES, Lieut., M. R. C., U. S. Army, to Mrs. Estelle Bland Hill, both of Lompoc, Calif., at Santa Ana, Calif., February 24.

WILLIAM CHAMBERS, Lieut.-Com., U. S. Navy, to Miss Kathryn A. Willis of Atlantic City, N. J., at Peking, China, February 2.

CHARLES WILLIAM FINNERTY, West Somerville, Mass., to Miss Sara Agnes Flannigan of Portsmouth, Ohio, January 26.

JOHN M. SKIRPAN, Monessen, Pa., to Miss Emma Dorothy Hadock of Plymouth, Pa., January 12.

JAMES THOMAS A. WRIGHT, New York, to Miss Mayme Raymer of Pittsburgh, Nov. 3, 1920.

ARTHUR ALLEN GIBSON to Mrs. Margaret Mae Hale, both of Somerville, Mass., March 6.

CARL LESLIE HOAG, San Francisco, to Miss Josephine Green of Santa Cruz, Calif., March 3.

SIGMUND ARTHUR AGATSTON to Miss Blanche Simon, both of New York, March 11.

Deaths

James Donald Dunlop ● Alpena, Mich.; University of the City of New York, 1884; Queens University, Kingston, Ont., 1887; aged 65; superintendent of the Alpena City Hospital from 1886-1890; for three years health officer of Alpena; at one time president of the Thunder Bay Medical Society and Alpena County Medical Society; died, March 2, following an operation for appendicitis.

Austin Ira Donaldson, Washington, Ind.; Medical College of Indiana, Indianapolis, 1903; aged 47; a member of the Indiana State Medical Association; captain, M. C., U. S. Army, and discharged, Dec. 21, 1918; health commissioner of Daviess County; died, February 27, from typhoid fever.

Frank Walker Sears, Binghamton, N. Y.; College of Physicians and Surgeons in the City of New York, 1895; aged 63; a member of the Medical Society of the State of New York; major, M. C., N. Y. N. G., and discharged, April 3, 1919; died, March 8, from pneumonia.

Charles Maitland Mann, Petersburg, N. Y.; Cornell University Medical College, Ithaca and New York, 1907; aged 37; lieutenant, M. C., U. S. Army, and discharged, July 21, 1919; a member of the Medical Society of the State of New York; died, March 7.

Bernard Blaine Buell, Vermilion, Ohio; Cleveland College of Physicians and Surgeons, 1909; aged 37; a member of the Ohio State Medical Association; was instantly killed, March 14, when the automobile in which he was riding was struck by a passenger train.

Harrison Stephenson Marsh, Kansas City, Mo.; University of Missouri, Columbia, 1908; aged 34; pediatrist to St. Anthony's Home for Infants, and a member of the staff of the General Hospital, Kansas City; died, February 10, following an operation.

Edward Leroy Leonard, Fulton, Ohio; Starling Medical College, Columbus, Ohio, 1892; aged 57; captain, M. C., U. S. Army, and discharged, Dec. 12, 1918; a member of the Ohio State Medical Association; died, March 7, from heart disease.

Albert Clayton Carney ● Hamilton, Ohio; Medical College of Ohio, Cincinnati, 1889; aged 52; a member of the American Academy of Ophthalmology and Oto-Laryngology; died, March 2, from cardiorenal disease.

Frederick Hamilton Blayney ● Capt., M. C., U. S. Army, Chicago; University of Illinois, Chicago, 1898; aged 51; major, M. C., Ill. N. G., prior to the World War; died in Washington, D. C., March 4.

Rufus I. Teague, Roxboro, N. C.; University of Maryland, Baltimore, 1890; aged 56; a member of the Medical Society of the State of North Carolina; died in St. Luke's Hospital, Richmond, Va., Dec. 27, 1920.

James Way Allbritain, Columbus, Ohio; Ohio Medical University, Columbus, 1898; aged 45; who served with an aero squadron in France during the World War; died, March 5, from lethargic encephalitis.

Henry W. A. Pechmann, Holley and Hulbutson, N. Y.; Bellevue Hospital Medical College, 1895; a member of the Medical Society of the State of New York; died, March 5, from cerebral hemorrhage.

Henry D. Squire, Sheboygan, Wis.; Western Homeopathic College, Cleveland, 1864; aged 81; a practitioner of Sheboygan for nearly half a century; died, March 1, from cerebral hemorrhage.

Joseph Jerome Ferguson ● Greenville, Miss.; University of Nashville, Tenn., 1903; aged 52; president of the Washington County Medical Society; died, February 28, from cerebral hemorrhage.

James Ruffin Cottell, Louisville, Ky.; University of Louisville, Ky., 1912; aged 30; lieutenant, M. C., U. S. Army, and discharged, Sept. 9, 1918; died, February 23, from nephritis.

George Albert Bragdon, Middletown, Conn.; Bowdoin Medical School, Brunswick and Portland, Me., 1870; aged 79; a member of the Massachusetts Medical Society; died, March 3.

John D. Green, Manilla, Ind. Louisville (Ky.) Medical College, 1897; aged 57; a member of the Indiana State Medical Association; died, February 26, from cerebral hemorrhage.

Louis W. Bains, Brookshire, Texas; Tulane University, New Orleans, 1885; aged 58; a member of the State Medical Association of Texas; died in Houston, Texas, February 25.

Harry Byron Patterson ● Pittsburgh; University of Pennsylvania, Philadelphia, 1901; aged 41; major, M. C., U. S. Army, and discharged, June 25, 1919; died, Dec. 31, 1920.

Arthur R. Chopzin ● Capt., M. C., U. S. Army, Alexandria, La.; Tulane University, New Orleans, 1894; aged 51; on duty at Fort Sam Houston, Texas; died, February 28.

Amasa Howard, Chelmsford, Mass.; Dartmouth Medical School, Hanover, N. H., 1882; aged 63; a member of the Massachusetts Medical Society; died, March 2.

Edmond Joseph Beardsley, Alexandria, Ind.; Chicago Homeopathic Medical College, 1886; aged 59; health officer of Alexandria for fifteen years; died, February 28.

William T. Campbell, Media, Pa.; Hahnemann Medical College and Hospital, Philadelphia, 1882; aged 65; also a dentist; died, February 23, from heart disease.

George L. Bomberger, Independence, W. Va.; University of Pennsylvania, Philadelphia, 1865; aged 80; a veteran of the Civil War; died, March 2, from heart disease.

Eugene Joseph Therrien, Derry, N. H.; University of Vermont, Burlington, 1915; aged 30; captain, M. C., U. S. Army, and discharged, Sept. 2, 1919; died, recently.

Adelbiert Allen John, Oregon, Ill.; Chicago Medical College, 1898; aged 64; died at Augustana Hospital, Chicago, March 2, from carcinoma of the stomach.

Charles Caldwell, Mansfield, Ohio; Harvard University Medical School, 1867; aged 79; a veteran of the Civil War; died, February 26, from senile debility.

George F. Lavin, Detroit; Michigan College of Medicine and Surgery, Detroit, 1894; aged 50; for twelve years city physician of Detroit; died, March 2.

Byron R. O'Connor, Petaluma, Calif.; Philadelphia University of Medicine and Surgery, 1867; aged 82; died, February 25, from heart disease.

Charles W. Wigglesworth ● Oakley, Kan.; Ensworth Medical College, St. Joseph, Mo., 1886; aged 66; died, February 18, from pernicious anemia.

Francis Philip Conway, Newport, R. I.; University of Vermont, Burlington, 1889; aged 46; died, in Brooklyn, February 12, from heart disease.

Ramon Ramirez Santibanez, Mayaguez, P. R.; Jefferson Medical College, 1916; aged 27; died, February 25, from pulmonary tuberculosis.

George Washington Gardiner, Philadelphia; Hahnemann Medical College of Philadelphia, 1876; aged 69; died, suddenly, February 28.

John Scott Rice, Laurel, Ind.; Bellevue Hospital Medical College, 1866; aged 75; also a dentist; died, February 27, from heart disease.

Benjamin Franklin Holmes, Hillsboro, Ohio (license, Ohio, 1896); aged 78; a veteran of the Civil War; died, January 21, from pneumonia.

William J. Sloan, East Liverpool, Ohio; Pulte Medical College, Cincinnati, 1886; aged 80; a veteran of the Civil War; died, January 27.

Richard R. Wheatley, Grand Rapids, Mich.; Jefferson Medical College, 1868; aged 81; died, February 26, from cerebral hemorrhage.

Lawrence Andrew Lynch ● Kansas City, Kan.; John A. Creighton Medical College, Omaha, 1914; aged 28; died, January 3.

Thomas G. Huisinga, Zeeland, Mich.; University of Michigan, Ann Arbor, 1881; aged 60; died in Miami, Fla., February 26.

Marcus A. McKendree ● Bowling Green, Ohio; Eclectic Medical Institute, Cincinnati 1884; aged 67; died, February 23.

Sharp Wilson Hemphill, East Liverpool, Ohio (license, Ohio, 1896); aged 72; died, February 23, from valvular heart disease.

J. M. Rendleman, Exira, Iowa; Atlanta (Ga.) Medical College, 1860; aged 83; a Confederate veteran; died, Dec. 25, 1920.

Augustus Knapp Van Horne, Long Beach, Calif.; Jefferson Medical College, 1856; aged 86; died, February 25.

Charles Augustus Gottman ● Detroit; University of Michigan, Ann Arbor, 1890; aged 51; died, February 10.

Abraham Fernlund, Ogden, Utah (license, Utah, 1893); aged 68; died, February 22, from heart disease.

Benjamin Chilson ● Beloit, Wis.; State University of Iowa, Iowa City, 1882; aged 63; died, March 3.

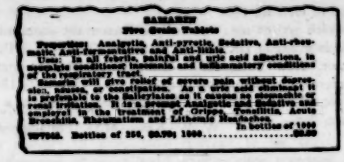
● Indicates "Fellow" of the American Medical Association.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

"MODIFIED SALICYLIC ACID" AND "SAMARIN"

The attention of the Laboratory was called to "Modified Salicylic Acid" and "Samarin" put out by the Frank S. Betz Co. of Hammond, Ind. Both are described in the Betz pharmaceutical catalogue but no information is given concerning their composition. In general the Betz pharmaceuticals are nonsecret in composition. These exceptions, therefore, are noteworthy. Since each product is advertised in the


SAMARIN
Five Grain Tablets
Properties: Analgesic, Anti-pyretic, Sedative, Anti-rheumatic, Anti-fermentative and Anti-lithic
Uses: In all febrile, painful and uric acid affections, in neuralgic conditions, insomnia and inflammatory conditions of the respiratory tract.
Samarin will give relief of severe pain without depression, nausea, or constipation. As a uric acid eliminant it is preferable to the Salicylates, as it causes no stomachic or renal irritation. It is a prompt Analgesic and Sedative and extensively employed in the treatment of Grippe, Tonsilitis, Acute Bronchitis, Rheumatism and Lithemic Headaches.
In bottles of 1000
SAMARIN. Bottles of 250, $3.50; 1000.....$12.50

A reduced reproduction of the description in the Betz catalogue of "Samarin." The Association's chemists reported that this preparation is a mixture of acetanilid and a salicylate. The label on Samarin failed to declare the presence or amount of acetanilid as the Federal law requires.

catalogue under claims which seemed questionable, regardless of the composition of the preparation, a specimen each of "Modified Salicylic Acid Tablets" and "Samarin Tablets" was obtained and each was examined in the Association's Laboratory.

MODIFIED SALICYLIC ACID

The tablets of modified salicylic acid were labeled: "Tablets Modified Salicylic Acid 5 Gr. Each tablet contains 4 grs. Acid Salicylic so treated as to render it nonirritating to the stomach." The following statements concerning the product are found in the Betz catalogue:

"A Substitute for Aspirin and the Salicylates.

"A new product made only in the Betz Laboratory, known by physiological and other tests to be equal to Acetyl Salicylic Acid (Arpirin), and sold at a much lower price.

"The one advantage Aspirin has over Salicylic Acid, is its neutrality and freedom from stomachic irritation; the same can be said of Modified Salicylic Acid.

"Uses—Myalgia, neuralgia and inflammatory rheumatism.

"As an Analgesic—Modified Salicylic Acid comes in competition with Acetanilid and other coal tar products, for the relief of headaches, neuritis and similar painful conditions.

"As an Antipyretic—It far exceeds the Salicylates in power. It has been used for the reduction of the temperature in typhoid fever and rheumatic fever; recommended in acute tonsilitis; also in eczema and other skin diseases.

"The dose of Modified Salicylic Acid is from five to fifteen grains (0.32—1.0 gm.), (same as Aspirin)."

The average weight of ten of the tablets was 0.3843 gm., or about 5.9 grains. Qualitative tests indicated the presence of acetylsalicylic acid (aspirin), calcium sulphate (gypsum), starch, and an acid-insoluble, incombustible substance which was probably talc. The composition of the tablets was found to be essentially as follows:

Acetylsalicylic Acid	81.5 per cent.
Calcium sulphate (gypsum)	9.2 per cent.
Talc (acid insoluble)	0.7 per cent.
Starch (by difference)	8.6 per cent.

Each tablet of "Modified Salicylic Acid" contains, therefore, about 4.8 grains of acetylsalicylic acid and about half a grain each of gypsum and starch with a trace of talc. In other words the product essentially is aspirin. Calcium sulphate, either as gypsum or plaster of Paris, has no use in internal medicine. Neither has it any legitimate place in the manufacture of tablets. Its presence in "Modified Salicylic Acid," therefore, is entirely unjustified either by therapeutic or pharmaceutic necessity. There is nothing in this "new product made only in the Betz Laboratory" to warrant the secrecy under which it is sold, nor the extravagant claims which are made for it. Physicians who desire to prescribe acetylsalicylic acid will find several brands of unquestionable purity from reputable manufacturers described in New and Nonofficial Remedies.

SAMARIN

The following statements concerning Samarin are made on the label of the preparation:

"Properties: Analgesic, Anti-pyretic, Sedative, Antirheumatic, Anti-fermentative and Anti-lithic, freely soluble, tolerated by the most delicate stomach.

"Uses: In all febrile, painful and uric acid affections, particularly indicated in all neuralgic conditions, insomnia and inflammatory conditions of the respiratory tract.

"Dose—One to three tablets of Samarin, repeated every two or three hours as indicated, not to exceed twelve tablets a day.

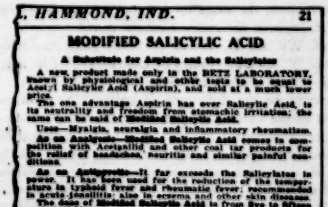
"Samarin will give almost immediate relief of severe pain without depression, nausea, or constipation. As a uric acid eliminant it is preferable to the Salicylates, as it causes no stomachic or renal irritation. It is a prompt Analgesic and Sedative, and extensively employed in the treatment of Grippe, Tonsilitis, Acute Bronchitis, Rheumatism and Lithemic Headaches."

The Samarin tablets examined were uncoated and were dyed green throughout. The average weight of ten tablets was 0.35972 gm., or about 5½ grains. Qualitative tests indicated the absence of pyramidon, acetphenetidin, acetylsalicylic acid, free salicylic acid, caffein and other alkaloids, lithium salts and sodium bicarbonate. Tests were obtained for acetanilid, a salicylate, calcium, a sulphate, an acid insoluble, incombustible substance which was probably talc, starch, and a green dye which was not identified.

The analysis indicated the composition of the tablets to be essentially as follows:

Acetanilid	37 per cent.
Calcium Salicylate	32 per cent.
Calcium sulphate (gypsum)	7 per cent.
Talc (acid-insoluble)	6 per cent.
Starch and coloring (by difference)	18 per cent.

The analysis of Samarin tablets shows that, when stripped of secrecy, misrepresentations and advertising bombast, the preparation is essentially a mixture of acetanilid with a


L, HAMMOND, IND. 21
MODIFIED SALICYLIC ACID
A Substitute for Aspirin and the Salicylates
A new product made only in the BETZ LABORATORY, known by physiological and other tests to be equal to Acetyl Salicylic Acid (Aspirin), and sold at a much lower price.
The one advantage Aspirin has over Salicylic Acid, is its neutrality and freedom from stomachic irritation; the same can be said of Modified Salicylic Acid.
Uses—Myalgia, neuralgia and inflammatory rheumatism.
As an Analgesic—Modified Salicylic Acid comes in competition with Acetanilid and other coal tar products for the relief of headaches, neuritis and similar painful conditions.
As an Antipyretic—It far exceeds the Salicylates in power. It has been used for the reduction of the temperature in typhoid fever and rheumatic fever; recommended in acute tonsilitis; also in eczema and other skin diseases.
The dose of Modified Salicylic Acid is from five to fifteen grains (0.32—1.0 gm.), (same as Aspirin). If you are not satisfied with results, we will take back any unused portion and refund your money.
In writing orders or prescriptions just say, "Modified Sal. Acid."
Prices:
Five Grain Tablets, per M.....$1.50
Three Grain Tablets, per M.....1.25
Powder, per oz.....50

A reduced reproduction of the description in the Betz pharmaceutical catalogue of "Modified Salicylic Acid." The Association's chemists found that the product is essentially acetylsalicylic acid (aspirin) with gypsum, starch and talc.

salicylate. The salicylate found is equivalent to about 25 per cent. of free salicylic acid. Each tablet is equivalent to about 2 grains of acetanilid and nearly 1½ grains of salicylic acid. The presence of acetanilid is not declared on the label of the mixture as is required by law. Physicians know that acetanilid is not a safe drug to prescribe in unlimited doses. That the Frank S. Betz Co. is aware of the unsafe character of Samarin is evidenced by the warning on the label not to take more than twelve tablets in a day. Yet the physician who prescribes Samarin does not know that he is giving either acetanilid or a salicylate.

Correspondence

THE ENCYCLOPEDIA BRITANNICA AND THE DATE OF THE INTRODUCTION OF ANESTHESIA

To the Editor:—In my paper on "Vivisection" in the *Country Gentleman*, Feb. 12, 1921, the text reads: "Prior to *September 30, 1846*, anesthesia was impossible, for no effective anesthetic was known." In my manuscript, I had written: "Prior to *October 16, 1846*, anesthesia was impossible," etc.

Unfortunately, I did not observe in the revised proof that the date had been altered. I am unwilling to allow my want of care in reading the revised proof to perpetuate and even to support an erroneous date for the first public demonstration of anesthesia. This date is one of the most important in the entire Chronology of Medicine.

The change, I am told, was made by reason of the statement in the Encyclopedia Britannica (Edition 11, Vol. I, p. 1908). This reads: "On the 30th day of September, 1846, Dr. Morton . . . employed the vapour of ether to procure general anesthesia in a case of tooth-extraction, and thereafter administered it in cases requiring surgical operation with complete success. This great achievement marked a new era in surgery." It will be observed that, while the text does not state explicitly that this was the first public administration of ether, the implication that it was the first is very clear.

As a matter of fact, this was not a public demonstration, but a private operation done in Dr. Morton's office. It was not a case of surgical anesthesia. The very brief period of unconsciousness necessary for the instantaneous extraction of a tooth differs materially from a surgical operation, such as was done in the Massachusetts General Hospital, Oct. 16, 1846, when Dr. John C. Warren dissected out a tumor from the neck of Gilbert Abbott, in the presence of the Harvard medical students and a number of distinguished medical men who had been invited to witness the operation. *As a result of this operation, the news of surgical anesthesia spread like wildfire throughout the entire civilized world.*

As Prof. William H. Welch of Johns Hopkins University says in his "Ether Day Address," Oct. 16, 1908 (the first of a series of formal annual addresses on "Ether Day"): "But, whatever may be the difference of opinion [he is discussing the merits of the various claimants for the honor of introducing surgical anesthesia] *one fact of the first historical importance stands and will continue to stand unshaken; the world received the gift of surgical anesthesia as the immediate and direct result of the convincing, public demonstration of its efficacy in this hospital* [the Massachusetts General Hospital] *on the sixteenth day of October, 1846.*"

This public demonstration of surgical anesthesia also gave rise to the nomenclature introduced by Oliver Wendell Holmes, namely, "anesthesia, anesthetic, anesthetist," etc., words then coined by Holmes, for there existed no English term (and its derivatives) for such a state of unconsciousness to pain preceding Oct. 16, 1846.

It is perfectly true that Dr. Crawford W. Long, in Jefferson, Ga., in March, 1842—more than four years before the Morton-Warren operation—did remove a small tumor from a patient under influence of ether. About eight minor surgical operations on patients under ether were performed by him after that date, but, to quote Dr. Welch again, "We cannot assign to him [Long] any influence upon the historical development of our knowledge of surgical anesthesia, or any share in the introduction to the world at large of the blessings of this matchless discovery."

Long made no claim whatever that he was the first to administer ether, nor did he publish a word about it until three years after that first public administration in the Massachusetts General Hospital. In other words, he lacked the alert mind which would instantly have perceived the immense importance of the great discovery which he had stumbled upon. In fact, almost nothing was known about Long's operations until they were exploited by Dr. J. Marion Sims, thirty-one years after 1846 (*Virginia Medical Monthly* **4**:81-100, 1877).

The writer in the Encyclopedia Britannica, a London anesthetist, has given a very incomplete history of the introduction of anesthesia. He has entirely missed the historic significance of the first public surgical operation under ether, Oct. 16, 1846, as contrasted with the private dental operation of Sept. 30, 1846, by Morton, and the still earlier minor surgical operations by Long. He seems, indeed, not to have known anything of this much earlier surgical use of ether by Long, for he does not even mention it, nor does he refer to the operation of Oct. 16, 1846.

Dr. Welch writes me: "A full and accurate statement of the facts is given in Dr. Nathan P. Rice's 'Trials of a Public Benefactor,' New York, 1859. On page 63, Morton himself says (referring to the public operation on October 16, 1846): 'This I consider to be the first demonstration of this new fact in science.'"

W. W. Keen, M.D., Philadelphia.

THE DUCT SIGN IN MUMPS

To the Editor:—Under this title, Cowie (*Am. J. Dis. Child.* **20**:74 [Aug.] 1920) described in detail a "teatulation" of the parotid duct and reddening of its orifice as a sign in mumps. In his conclusions, based on a study of fifty-seven cases, he says, "The duct sign was present in 96 per cent. of the cases recorded, and is probably present in all cases of parotid mumps at some time in the course of the disease."

While in the medical service at the base hospital at Camp Upton, New York, under the supervision of Major Harlow Brooks, I observed daily, for a period of about three months, about 1,000 cases of epidemic parotitis occurring mostly in southern negro soldiers. Unfortunately, however, I have available no accurate statistics of these cases.

At the meeting of the Associated Physicians of Long Island, held at the base hospital, Camp Upton, Long Island, June 22, 1918, I prepared the following program of selected cases in my wards: Mumps: (1) parotid duct redness as a sign; (2) epididymitis—a rather frequent complication; (3) cases of meningism at the onset; (4) endocarditis—a complication; (5) relapse nine days after discharge; (6) sore throat as a prodromal symptom, and (7) the blood picture in mumps.

The parotid duct redness, as I then described it, corresponded almost exactly with the description given by Cowie. I observed the teatulation of the duct and redness of the orifice in most of the cases, but in no case did I see any of the "minute hemorrhagic points" mentioned in his article. Also, at some time or other in almost all of our cases, I was able to observe the exudation from the affected duct of the "clear limpid fluid" mentioned by him. My observations fully confirm his, that "the duct sign is uninfluenced by fever."

In a monograph on "Epidemic Parotitis as a Military Disease" (*M. Clinics N. America* **2**:492 [Sept.] 1918) in which Brooks reports the cases seen at the Base Hospital at Camp Upton from Sept. 5, 1917, to July 12, 1918, he makes only passing mention of the duct sign by saying: "One does usually note that the papilla is edematous, swollen and inflamed, but, in my opinion, not to a diagnostic degree." It is because I was unable, in at least 25 per cent. of the definite cases, to demonstrate this duct sign (neither teatulation nor redness) on the affected side or sides at any time during the disease, that I concluded, as does Cowie, that "the duct sign

should be regarded as corroborative evidence of parotid gland involvement."

Moreover, I saw the typical teatulation and redness of the duct in several negroes who never developed the disease or any of its complications. It is true, as Cowie says, that "because of the occasional occurrence of teatulation of Steno's duct in a certain percentage of apparently normal persons and occasionally redness of its orifice, careful differentiation should be made." I observed the teatulation alone in a large number of apparently normal negro soldiers. *The typical duct sign (teatulation and redness) as observed in a large percentage of those who had the disease I also found in many apparently normal negroes.* Whether these typical findings could be found in a similar number of normal white people, I am unable to state.

The London *Medical Press*, in a recent editorial (Oct. 20, 1920, p. 303) fully confirms my opinion as regards this sign when it says: "But to what extent this sign can be regarded as pathognomonic of the disease is still doubtful, for it may also be apparent in a certain number of normal individuals."

SAMUEL K. LEVY, M.D., Brooklyn.

THE GLOVER CANCER SERUM

To the Editor:—During the month of December, 1920, a large number of physicians referred to me copies of an advertisement of an alleged cancer cure prepared by the T. J. Glover Research Laboratories of Toronto, Canada. I immediately obtained some of this serum from the makers, at a cost of $25 for five doses (about 5 c.c. of serum). The serum was a clear, amber colored fluid. During the experiments it was kept, as directed, in a cool place, and it was handled and administered under the most careful asepsis.

This serum was tested on carcinomas and sarcomas of the white rat. These were transplanted tumors which had originated in the mamma of the rat and were much less malignant than the corresponding human tumors. It was assumed that the doses for the rat should be proportional to body weight. In some instances the serum was injected directly into the tumor, in others it was injected subcutaneously or intramuscularly, as recommended by Dr. Glover, and the time intervals also were proportioned as recommended. The serum appeared to be rather toxic, and the injected animals failed slowly in health.

The treatment had not the slightest effect on the growth rate of tumors of either type, nor was any tumor cured. It is evident, therefore, that the statement made by Dr. Glover to the effect that this serum is of no use in the treatment of sarcoma is correct. To this should be added the further statement that the serum has not the slightest effect on carcinomas of the white rat.

These results confirm the report of the Toronto Academy of Medicine, published in THE JOURNAL (Feb. 5, 1921, p. 397) as to the worthlessness of this serum as a therapeutic agent for malignant tumors.

FRANCIS CARTER WOOD, M.D., New York.
Director of Cancer Research, George Crocker Special Research Fund.

Pulmonary Tuberculosis in Athletes.—It would seem self-evident that, as the main or sole business of the lungs is to serve as an organ for gas exchange, any restriction of their functionating area must be regarded as unphysiological and liable to invite disease. It is a popular impression, for which there is some evidence, that pulmonary tuberculosis is especially liable to attack athletes after they abandon vigorous exercises and assume a sedentary life. In such a case it seems probable that redundancy of pulmonary tissue would lead to excessive atelectasis.—H. Sewall, *Am. Rev. Tuberc.* 4:825, 1921.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, April 5-6. Sec., Dr. Ancil Martin, 207 Goodrich Bldg., Phoenix.

ARKANSAS: Little Rock, May 10. Sec., Reg. Bd., Dr. T. J. Stout, Brinkley. Sec., Eclectic Bd., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith.

COLORADO: Denver, April 5. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, April 12. Sec., Dr. Edgar P. Copeland, 1315 Rhode Island Ave., Washington.

HAWAII: Honolulu, April 11. Sec., Dr. Guy C. Milnor, 401 S. Beretania St., Honolulu.

IDAHO: Boise, April 5. Director, Mr. Paul Davis, Boise.

IOWA: Des Moines, April 12-14. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

KENTUCKY: Louisville, May 10. Sec., Dr. A. T. McCormack, Sixth and Main Sts., Louisville.

LOUISIANA: New Orleans, May 3. Sec., Dr. F. H. Hardenstein, 702 Maccheca Bldg., New Orleans.

MINNESOTA: Minneapolis, April 5-7. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MONTANA: Helena, April 12. Sec., Dr. S. A. Cooney, Power Bldg., Helena.

NEVADA: Carson City, May 2. Sec., Dr. S. L. Lee, Carson City.

NEW MEXICO: Santa Fe, April 11-12. Sec., Dr. R. E. McBride, Las Cruces.

OKLAHOMA: Oklahoma City, April 12-13. Sec., Dr. J. M. Byrum, Shawnee.

PORTO RICO: San Juan, April 5. Sec., Dr. Manuel Quevedo Baez, San Juan.

RHODE ISLAND: Providence, April 7-8. Sec., Dr. Byron U. Richards, State House, Providence.

UTAH: Salt Lake City, April 4-5. Sec., Dr. C. L. Olsen, 932 South 5th East St., Salt Lake City.

West Virginia October Examination

Dr. R. T. Davis, state health commissioner, West Virginia Public Health Council, reports the oral and written examination held at Charleston, Oct. 12, 1920. The examination covered 11 subjects and included 132 questions. An average of 80 per cent. was required to pass. Of the 14 candidates examined, 13, including 1 chiropractor, passed, and 1 failed. Fifteen candidates were licensed by reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
George Washington University	(1920)	88
University of Maryland	(1918) 88, (1920)	84, 88
St. Louis College of Physicians and Surgeons	(1918)*	*
Western Reserve University	(1919)	90
Jefferson Medical College	(1917) 84, (1920)	83
University of Pennsylvania	(1917)	87
Meharry Medical College	(1920)	80
University of Virginia	(1918)	89
National University, Athens	(1911)†	91
FAILED		
Meharry Medical College	(1918)	68

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University		(1895)	Ohio
Kentucky University		(1905)	Virginia
Baltimore Medical College	(1898) Maryland,	(1911)	Virginia
University of Maryland	(1910) Maryland,	(1914)	S. Carolina
University of Minnesota Homeopathic Med. Dept.		(1905)	Minnesota
University of Cincinnati		(1915)	Ohio
Jefferson Medical College		(1915)	Penna.
University of Pennsylvania		(1910)	Maryland
Meharry Medical College	(1897) South Carolina,	(1915)	Georgia
University of the South		(1909)	Virginia
Medical College of Virginia		(1917)	Virginia
University College of Medicine, Richmond		(1912)	Virginia

* Grade not given.
† Graduation not verified.

Massachusetts November Examination

Dr. Walter P. Bowers, secretary, Massachusetts Board of Registration in Medicine, reports the oral, written and practical examination held at Boston, Nov. 11-13, 1920. The examination covered 13 subjects and included 70 questions. An average of 75 per cent. was required to pass. Of the 46 candidates examined, 27, including 2 osteopaths, passed, and 19, including 8 osteopaths, failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Georgetown University	(1915) 80.8,	(1918)	84.5
George Washington University		(1907)	83.4
Tulane University		(1918)	81.5
College of Physicians and Surgeons, Boston		(1920)	76.4, 76.5
Harvard University	(1919) 80.7,	(1920) 83.4, 85.2, 86.2, (1921)* 79.3, 80.8	

Middlesex College of Medicine and Surgery	(1919) (1920) 77.8, 81.7, 83.9	75.1,
Tufts College Medical School	(1917) 84.2, (1919)	78.7
Jefferson Medical College	(1917)	84.5
Temple University	(1919)	78
Women's Medical College of Pennsylvania	(1915)	76.8
University of Virginia	(1917)	89.2
University of Vermont	(1920)	76
Queen's University	(1920)	76.2
McGill University	(1918)	81

Dr. Bowers also reports 3 candidates licensed by special examination:

PASSED College	Year Grad.	Per Cent.
Harvard University	(1892)	83.5
University of Vermont	(1918)	80.2
University of Edinburgh	(1902)	84.2

FAILED		
University of Southern California	(1920)	63.4
Emory University	(1920)	71.9
Baltimore Medical College	(1902)	72
College of Physicians and Surgeons, Boston	(1920) 51.7, 70.8,	72.1
Middlesex College of Medicine and Surgery	(1920) 62.5,	71.3
Tufts College	(1920)	72.1
University of Naples	(1914)†	
Laval University	(1920)‡	60

* These candidates had completed all requirements for the M.D. degree which was awarded in February, 1921.
† Grade not given.
‡ Graduation not verified.

Louisiana December Report

Dr. E. W. Mahler, secretary, Louisiana State Board of Medical Examiners, reports the written examination held at New Orleans, Dec. 2-4, 1920. The examination covered 12 subjects and included 100 questions. An average of 75 per cent. was required to pass. Twelve candidates were examined, all of whom passed. Three candidates were licensed by reciprocity. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Tulane University	(1912) 76.1, (1920) 77.9, 82.9, 87.2, 88.2,	88.3
University of Oklahoma	(1917)	80.3
University of Pennsylvania	(1920)	87.5
Memphis Hospital Medical College	(1901)*	72.8
University of Tennessee	(1908)*	73.8
University of Texas	(1920)	90
University of Virginia	(1920)	86.5

LICENSED BY RECIPROCITY College	Year Grad.	Reciprocity with
Tulane University	(1914)	Alabama
University of Michigan Medical School	(1907)	Michigan
University of Virginia	(1911)	Michigan

* Credit allowed for years of practice.

Book Notices

Medical Gymnastics in Medicine and Surgery. By E. Bellis Clayton, M.B., B.C., Director of the Physiotherapeutic Department, King's College Hospital, London. Cloth. Price $1.80 net. Pp. 159. New York: Longmans, Green and Co., 1920.

This book has been written for students of medical gymnastics to be used alongside a book that describes the technic of the various exercises and manipulations, such as Kleen's "Massage and Medical Gymnastics." It attempts to make the operator more intelligent in the application of the prescribed gymnastic treatment by teaching something about the nature of various diseases. "It is essential," says the author that "the masseuse should understand something about the condition which she is treating. There is a great difference between an intelligent, well-taught masseuse and a masseuse who works like a machine. The more thorough the training of the masseuse, the more she realizes that she must rely on her medical man for directions as to details of treatment." It is so obvious that the more of medicine the masseur understands, the better a masseur he is, that it may be questioned whether massage should be practiced by any one who does not have a thorough medical training. Medical gymnastics ignorantly applied may not only be useless, but actually harmful. If medical schools would do their duty toward their students in connection with physical therapy, all physicians would be masseurs; and then we could insist that all *medical* massage be administered by physicians. To this proposition the busy practitioner may object on the ground that he lacks the time. He should remember, however, that right here would be a good field for the help of young medical men just starting in practice, who usually have more time on their hands than they know what to do with. For the limited purpose for which this book is devised, it is well gotten up. The author does not hesitate to say that "in this condition massage is useless," or "medical gymnastics are not indicated." For medical men this book is hardly suitable, as it is merely an epitome of medicine in which a special effort is made to show the indications for massage. Until the day arrives when physicians administer medical gymnastics, this book might be recommended to those who are fitting themselves to assist medical men in this line of work.

Block Anesthesia and Allied Subjects. With Special Chapters on the Maxillary Sinus, the Tonsils, and Neuralgias of the Nervus Trigeminus. For Oral Surgeons, Dentists, Laryngologists, Rhinologists, Otologists and Students. By Arthur E. Smith, D.D.S., M.D., Oral Surgeon to Frances Willard Hospital, Chicago. Cloth. Price, $15. Pp. 895, with 595 illustrations. St. Louis: C. V. Mosby Company, 1920.

This book will fill a distinct place on the shelves of surgeons of the head and neck, and its publication is an important service to surgical and dental science. It offers an up-to-date technic in local analgesia and block anesthesia, accompanied with illustrations that cover every detail of the various steps and maneuvers. The early chapters are devoted to a historical review of general and local anesthesia, together with an outline of the development of the latter, following which are a number of chapters covering the anatomic and general considerations. The latter half of the book gives in careful detail the methods of blocking the principal nerve trunks and their terminal branches. In this part of the work lies its greatest value. The author has used an impressive amount of patience to teach step by step every detail of each procedure. For each block injection the reader will find specific subheadings, such as anatomy, indications and contraindications, the needle employed, technic of injections, amount of solution to inject, time to wait for anesthesia, and structures anesthetized, and there is usually a paragraph on the blocking of interlacing or overlapping branches from neighboring nerves. By means of this arrangement the book becomes a valuable reference guide and as such will find many friends among oral surgeons, otorhinolaryngologists and dental surgeons. The illustrations, virtually all of which are original, are remarkable for their clarity and instructiveness.

Outlines of Physical Diagnosis of the Circulatory and Respiratory Systems. Prepared from the Lectures of Thomas Barnes Futcher, M.D., Associate Professor of Clinical Medicine, The Johns Hopkins University Medical School. By John Gardner Murray, Jr. Second edition. Cloth. Price, $2.75. Pp. 179. Baltimore: The Students' Book Store, 1920.

This volume is arranged with the text on one page, the other page being left blank for notes. It can be carried in the pocket. It is intended for the medical student, but should also be of value to any junior intern. The text is systematically arranged, brief, but fairly complete. For detailed explanations of various phenomena, the student should refer to a more voluminous reference book.

Diagnostische Winke für die Tägliche Praxis, ein Nachschlagbuch für Aerzte und Studierende. Von Dr. E. Graetzer. Second edition. Boards. Price, 16 marks. Pp. 264. Berlin: S. Karger, 1920.

This book is a miniature encyclopedia of medicine in which all the diseases are arranged in alphabetical order. A few of the symptoms and signs are given first, and then the atypical forms of the disease, including a short summary of the conditions requiring differentiation. Too much is attempted for such a small volume. The value that might accrue to the reader rests in the simple mentioning of the atypical variations, together with a short description of the condition under consideration.

La Madre y su Primer Hijo. By Dr. Jorge Bejarano, Médico-Director de la "Gota de leche" de Bogotá. Pp. 70. Paper. Bogotá, 1919.

This is one of recent publications on child hygiene which shows the interest being taken in this all important subject throughout Latin America. The book is written in an interesting style, well suited to its intended audience, the mothers of Colombia. De Bejarano is the director of an infants' milk depot in Bogota, and is familiar with his subject and the needs of his country.

Medicolegal

Fraudulent Exploitation of "Organo Tablets"

(Leach v. Carlisle (U. S.), 267 Fed. R. 61)

The United States Circuit Court of Appeals, Seventh Circuit, in affirming a decree in favor of the defendant, says that the suit was brought by the plaintiff, Fred Leach, doing business as the "Organo Product Company," asking that the defendant, postmaster at Chicago, be restrained from holding and disposing of the mail of the company as prescribed in a fraud order. The plaintiff, under the name of "Packers' Product Company," had previously been engaged in the business of selling an alleged remedy for sexual weakness and disorders in men, which he called "Orchic Extract," consisting of dried and powdered sheep's testicles made into tablet form; but, after a fraud order was issued, in 1918, against that company, and sustained, for conducting a scheme for obtaining money through the mails by false and fraudulent pretenses, he adopted the name of "Organo Product Company," made some changes in his advertising matter, and began marketing the same product, calling it "Organo Tablets."

The issue which was most warmly contested before the postmaster general was that of the merit of animal testicular substances as a remedy for sexual and nervous disorders. It was contended for the government that such remedies in general, and particularly when administered by the mouth, as this was, are so manifestly wanting in merit that any representations to the contrary are essentially fraudulent; while for the plaintiff it was contended, and some evidence tended to show, that such substances, administered as this was, have proved more or less beneficial in some of such ailments. Whether wholly or partly predicated on superstition or fact or both, the thought is as old as the hills that to partake by way of food or otherwise of certain parts of animals will produce beneficial effect in the corresponding part in man—the brain, the heart, the stomach, and notably the testicles. There has long been more or less prevalent the practice of resorting to the testicles of animals as an article of food or medication for prolonging, restoring or augmenting manly strength and sexual power. Considerable literature is extant on the subject, and it appears that some physicians employ such remedies, and that many others decry their use. Under the record facts the most that could be said was that physicians and others, who might reasonably be supposed to possess expert knowledge on the subject, disagree as to whether or not such substances have any remedial virtue. It was not the design of the statutes to vest the postmaster general with authority to determine between contradictory views held in apparent good faith on a subject the merits or demerits of which may fairly be said to be a matter of opinion among those who ought to know.

But any so-called remedy, however meritorious, may in its exploitation become the subject matter of fraud. Indeed, it is too often seen that articles to which more or less merit is popularly ascribed are made a basis or vehicle to carry the grossest frauds, serving only to lend semblance of good faith to the scheme. That modesty or prudery, or whatever else it may be called, which puts a ban on frank and unrestricted reference to human sexual parts, and enfolds their mention and consideration in secrecy and shame, has given quacks and charlatans a most fruitful field for operation, of which they have not been slow to take advantage. Sometimes boldly, but often by suggestion and innuendo, they undertake to make all men believe they have symptoms of most serious sexual disorders when, in truth, they are more often perfectly normal, and that the natural subsidence of virility (which is generally quite as certain as the flight of years) will be arrested, and the victim restored to the vigor of robust youth, and that all sexual troubles will be corrected, if only that particular nostrum be taken, or that plan persistently followed. He who would operate in this peculiar field of endeavor must have a special care that his scheme is not calculated to instil in men unfounded fears, or inspire in them false hopes, as a means to the end of obtaining their money. Careful perusal of the literature put out by the plaintiff to effect the sale of his tablets induced the conclusion that it did not differ materially from the old-time stuff; and the court is of the opinion that the record showed that the postmaster general had abundant ground for his order.

An Insane Person Cannot Be Called in Good Health

(Harris v. New York Life Ins. Co. (W. Va.), 104 S. E. R. 121)

The Supreme Court of Appeals of West Virginia, in reversing a judgment obtained by the plaintiff on a policy of insurance that was issued by the defendant company on the life of his wife, holds that an insane person cannot be said to be in good health. The court says that the defendant set forth that among other statements made by the insured in her application, on which the policy was issued, she undertook, in accordance with the provisions of the application, to give true answers in regard to her family history, some of the answers so given being that her father had died at the age of 65 years from blood poison; that he had been ill one month before his death, previous to which time his health had been good, whereas, instead of his health having been good up until one month prior to his death, he had been confined in an insane asylum for nine years prior thereto, afflicted with paresis. As to the condition of her father's health prior to the illness which resulted in his death, it might be said that the answer of the insured was but the expression of an opinion on her part; but that must be an honest opinion, and must be made in good faith. It appeared that the insured knew that her father had been afflicted for nine years, and because of that affliction had been confined in an insane asylum, and, notwithstanding she had actual knowledge of those facts, she answered that his health was good. It was argued that he was only insane, and that that was not a disease within the meaning of the policy. But the court cannot agree with that conclusion. The fact that the affliction with which one is suffering is a mental disease, instead of a physical disease, makes it no less a disease, and it cannot be said that, even though this answer be treated as an expression of opinion, it was made in good faith, when she knew that he was at the time of his death, and had been for a long while, confined in an asylum for the insane.

Death of Hospital Employee from Influenza as "Injury"

(City and County of San Francisco v. Industrial Accident Commission et al. (Calif.), 191 Pac. R. 26)

The Supreme Court of California affirms an award of compensation in favor of the widow of a hospital steward, named Slattery, who was taken with influenza, Oct. 15, 1918, and died of that disease eight days later. The court says that it was contended that the awarding of compensation under the workmen's compensation act for death by disease, the origin of which was not a bodily injury suffered through violence, was beyond the powers of the commission, under the provision of the state constitution at that time authorizing the legislature to create and enforce a liability on the part of employers to compensate their employees for any injury incurred in the course of their employment. In view, however, of the word "injury" having two possible meanings, a broad one and a narrow one, and the legislature, in construing this provision, having placed on the word the broader meaning, the provision of the workmen's compensation act, whereby a disease arising out of employment is declared to be an injury for which compensation shall be paid, is held to be operative and controlling, and is not unconstitutional.

Secondly, it was contended that Slattery did not contract the influenza from which he died because of his employment, as an epidemic of the disease was raging in the city at the time, and was so general in the city that every member of the community was exposed to it to a greater or less extent, and that one out of every ten in the city contracted it. On the other hand, the evidence showed that the incubation period of the disease was from one to four days, that Slattery in the course of his duties during the five days preceding his being taken ill had had to handle and had been exposed to at least twelve developed cases of influenza, that so far as known he was not exposed to any cases except in the course of his employment, that he lived only half a block from the hospital

where he was employed, and during the two weeks preceding his illness had been working very hard, and had gone directly from his home to his work and from his work to his home, and had not been out, that his exposure because of his work was far greater than that of the average person, and that among the nurses in the hospitals of the city, a class exposed in much the same degree as he was, the proportion who contracted the disease ran from 50 to 85 per cent. The preponderance of the medical testimony also was to the effect that he contracted the disease as a result of his peculiar exposure to it incidental to his employment. It, of course, could not be said that from these facts it was certain that Slattery contracted his sickness because of his employment. But certainty was not required.

If there had been no epidemic in San Francisco at the time, and it appeared that Slattery as hospital steward had been exposed directly to a considerable number of influenza patients, and was not known to have been exposed otherwise, and had come down with the disease within the period of incubation after his exposure, the conclusion that the disease was due to his exposure in the course of his work could hardly be questioned; and these were the actual facts, with the single exception that an epidemic was raging. To the extent of the severity of the epidemic the strength of the conclusion was weakened. It might well be that if the epidemic were so severe that the proportion of the general public who were attacked was anything like as great as the proportion of those exposed as was Slattery, the question of whether he was attacked because of the exposure incident to his employment or because of the exposure general to the public would be so much a matter of conjecture and speculation as not to warrant a definite conclusion as the basis of an award. But the proportion of persons exposed as was Slattery who were attacked was so great as compared with that of those not so exposed that it could not be said that the commission was not justified in concluding from it, in connection with the other facts, that his illness was due to the peculiar exposure of his employment. Its conclusion was the more justified by the fact that it coincided with the conclusions of most of the physicians who testified. The opinions of physicians on a point of this character are entitled to consideration, since it is a part of their vocation to observe diseases and how they spread, and to draw conclusions from their observations.

Damages Allowed for the Loss of an Eye

(P. Lorillard Co., Inc., v. Clay (Va.), 104 S. E. R. 384)

The Supreme Court of Appeals of Virginia, in reducing a judgment from $15,000 to $10,000 as damages for the loss of an eye by an unskilled workman about 21 years of age, who had been earning $14 a week before his injury and subsequently returned to his old job at an increase in wages of $4 a week, says that there is no rule of law fixing the measure of damages in cases of this kind. It is a matter to be left to the sound discretion and judgment of an impartial jury, whose verdict will not be disturbed unless it appears that they have been influenced by partiality or prejudice, or have been misled by some mistaken view of the merits of the case. But the opinions of jurors differ widely as to the amount of damages to be allowed. A rich man would not undergo serious physical pain for any amount of money, and would probably vote for large damages; whereas a poor man would probably put a much higher value on money and would vote for a smaller sum. The temperament of men also, and other considerations, lead them to vote for larger or smaller damages. So likewise the facts in one case may warrant a different verdict from the facts of another. The attendant suffering or the subsequent incapacity to follow one's usual calling may be different in one case from what they are in another. Where, however, the facts in a number of cases are substantially the same, the compensation to be made therefor ought not to be left wholly indeterminate, or wholly dependent on the verdict in a particular case, if any means can be discovered by which the amount of the compensation can be reasonably approximated. In eighteen cases, arising in ten different states, in which verdicts for the loss of an eye met the approval of the appelate courts of the states in which they were rendered, the verdicts ranged from $1,400 to $15,000, the average of the whole being $5,424. But many of those cases were decided years ago, and the cost of living has already increased in the last few years. In many respects it has more than doubled. This increase is a legitimate item to be taken into account in fixing the compensation to be made for personal injuries. In view of the average amount heretofore allowed in such cases, and of the recent great increase in the cost of living, the court thinks $10,000 to be a fair allowance here.

Association Not Liable for Expenses of Member Sick at Distant Place

(International & G. N. Ry. Employee's Hospital Association v. Bell (Texas), 224 S. W. R. 309)

The Court of Civil Appeals of Texas, in reversing a judgment for $1,193.10 that was rendered in favor of plaintiff Bell against the defendant hospital association, holds that he was not entitled to recover hospital, medical and surgical expenses incurred by him during a serious spell of sickness, in which he was stated to have had typhoid fever, that befell him in St. Louis, while he was in the performance of the duties of his employment by the International & Great Northern Railway Company. The court says that the association, as stated in its charter, was formed to provide medical and surgical treatment for its members, which included all of the employees of the railway company who might be injured or disabled by accident or sickness while in such employment, under such rules and regulations as might be prescribed by the board of trustees of the association. The fact that the plaintiff, under his contract of employment with the railway company, was required to pay monthly dues of 50 cents to the defendant association could not affect the question of the extent of the benefits to which he was entitled under the charter and rules of the association. Under the construction of those rules he was promised medical treatment only in case of accident or sickness occurring along the line of the road, where the evidence showed that the association had in its employ, for the purpose of treating its members, about 100 physicians and surgeons; and if treated by one of these elsewhere than in the association hospital such treatment could be only temporary, or in cases in which the member was too seriously injured or sick to be removed to the hospital. The plaintiff was unfortunate in that his sickness befell him where he could not obtain the treatment which his payment of the association dues would have entitled him to had his sickness occurred where the facilities for his treatment provided by the association were available; but his misfortune would not justify the extension of the benefits promised him by the association and the imposition of obligations on the association beyond the terms of the contract as evidenced by the charter and rules of the association.

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 19-21.
American Assn. of Genito-Urinary Surgeons, Richmond, Va., May 2-3.
American Association of Physicians, Atlantic City, May 10-11.
American Society for Clinical Investigation, Atlantic City, May 9.
Arizona Medical Association, Tucson, April 15-16.
Arkansas Medical Society, Hot Springs, May 3-5.
California, Medical Society of the State of, San Diego, May 10-12.
Connecticut State Medical Society, Hartford, May 18-19.
Florida Medical Association, Pensacola, May 10-11.
Georgia, Medical Association of, Rome, May 4.
Illinois State Medical Society, Springfield, May 17-19.
Iowa State Medical Society, Des Moines, May 11-13.
Kansas Medical Society, Wichita, April 26-28.
Louisiana State Medical Society, New Orleans, April 19-21.
Maryland, Medical and Chirurgical Faculty of, Baltimore, April 26-28.
Mississippi State Medical Association, Laurel, May 10-11.
Missouri State Medical Association, St. Joseph, May 17-19.
Nebraska State Medical Association, Lincoln, May 9-12.
New Mexico Medical Society, Albuquerque, April 28-30.
New York, Medical Society of the State of, Brooklyn, May 3.
North Carolina, Medical Society of the State of, Pinehurst, April 26-28.
Ohio State Medical Association, Columbus, May 3-5.
Oklahoma State Medical Association, McAlester, May 17-19.
South Carolina Medical Association, Columbia, April 19-20.
Tennessee State Medical Association, Nashville, April 12-14.
Texas, State Medical Association of, Dallas, May 10-12.
Western Electro-Therapeutic Association, Kansas City, Mo., April 21-23.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Gynecology, St. Louis

February, 1921, **1**, No. 5

*New Method of Subperitoneal Shortening of Round Ligaments of Uterus. H. Grad, New York.—p. 411.
*Pyelitis in Pregnancy; Report of Cases. G. Baughman, Richmond, Va.—p. 436.
*Thrombophlebitis During Puerperium Following Influenza; Report of Cases. L. F. Smead, Toledo, Ohio.—p. 447.
Pseudocholecystitis. H. D. Meeker, New York.—p. 454.
*Benign Mammary Tumors and Intestinal Toxemia. W. S. Bainbridge, New York.—p. 465.
Missed Abortion; Report of Cases. J. C. Litzenberg, Minneapolis.—p. 475.
*Splenic Leukemia Associated with Pregnancy. G. W. Kosmak, New York.—p. 485.
Ovarian Dermoid Cysts. B. R. McClellan, Xenia, Ohio.—p. 493.
*Status of Intrauterine Stem Persary: Study of 205 Cases with End-Results in 117 Cases. R. M. Rawls, New York.—p. 499.
Obstruction of Superior Mesenteric Vessels from Bands with Threatened Gangrene of Greater Part of Small Intestine; Recovery. J. N. West, New York.—p. 516.

Subperitoneal Shortening of Round Ligaments.—The operation devised by Grad aims to fasten the strongest portion of the round ligaments to the fibers of the internal ring of the inguinal canal, where the round ligaments emerge from the abdominal cavity. The ligaments are bared of their peritoneal investments and therefore, Grad says, connot fail to unite along the suture line. The proper amount of shortening of the round ligaments by plication in each case can be measured to a nicety. The author claims that by this method of operation no abnormal conditions are created in the pelvic cavity or abdominal wall; no holes are tunneled through the abdominal parieties; the ligaments cannot be overstretched and their vitality endangered by interference with their circulation. It is a definite surgical procedure with no drawbacks. Every step of the operation is under perfect mechanical control. The fallopian tubes are not liable to become traumatized or kinked; the mesosalpinx is not encroached on. With the operation completed, the pelvic organs are left in a normal condition. The operation of shortening the round ligaments is as a rule supplemented by shortening of the uterosacral ligaments and in a certain number of cases, the fundus of the uterus is held forward by a temporary catgut suture, which is placed in a special way. Grad separates the anterior layer of broad ligament from the posterior and after suturing together the folded part of the round ligament, it is buried between the two layers of the broad ligament and anchored in place. The anterior layer of the broad ligament is sutured to the posterior layer of the round ligament in such a manner as to cover all raw surfaces. An analysis of the end results in 100 cases has shown that the operation is an efficient one. It will hold the uterus in normal position and give relief from symptoms. It causes no complications during pregnancy or labor. The operation is devoid of mortality or morbidity. The final results of the operation show 95 per cent. of successes.

Pyelitis in Pregnancy.—Three cases of pyelitis in pregnancy are reported by Baughman. The patients were treated with pelvic lavage; pyelograms being taken from time to time as the pelvic size changed, provided the condition of the patient warranted this added discomfort. In all the cases the right pelvis was principally involved. In two cases the bladder was early and persistently involved. In one case the bladder was occasionally inflamed. In two cases the colon bacillus was the exciting cause. In the last case *Staphylococcus albus* was the causative organism. The symptoms in all cases improved under irrigation, but the most marked improvement was noted following delivery, showing that the obstruction was due to the uterus and its contents.

Thrombophlebitis Following Delivery.—In two of the three cases reported by Smead the onset of the thrombophlebitis occurred on the third day following delivery; in the third case it occurred on the seventh day. The temperature is the most reliable symptom. It rises suddenly from normal to 105 or 106 F. and, in a short time, falls to slightly above or below normal, where it remains until the next sudden rise. Severe, prolonged chills are present in the majority of cases. The pulse rate fluctuates with the temperature, but is relatively low until the patient begins to suffer from severe sepsis, the result of the development of metastatic foci or of extensive abscess formation about the veins or of septicemia. The blood cultures are as often negative as positive. The prolonged course of this disease, lasting for months, is quite characteristic. In phlebitis of the pelvic veins pain is usually absent. The nonsurgical treatment consists in general measures to keep up the body resistance, good food, abundance of fresh air, and the avoidance of anything which may dislodge the thrombus—such as douches, enemas, and pelvic examinations. Vaccine and serum treatment has been disappointing. The surgical treatment has consisted in the ligation or excision of the involved veins and in the drainage of perivascular abscesses. The transperitoneal route has proved better than the extraperitoneal or vaginal approach. The indications for operation are difficult to determine. The greatest conservatism must govern the choice of cases for operation. The majority of patients should not be subjected to operation.

Mammary Tumors and Intestinal Toxemia.—Bainbridge records twenty-five cases of abnormal mammary changes apparently caused by autointoxication. Each patient suffered from a coexistant chronic intestinal toxemia, and the amount of poisoning was reflected, in many instances, in the degree of change in the mammary tissue. When the autointoxication was relieved the breasts either markedly improved or returned entirely to the normal.

Splenic Leukemia in Pregnancy.—Two well developed and subsequently fatal cases of leukemia associated with pregnancy are reported by Kosmak. Ten similar cases have been recorded in the literature. In the majority of cases the woman survived but a short time after labor. One of the author's patients died before delivery took place. In every instance but one in which the definite diagnosis is presented, the splenomedullary type of the disease was observed.

Intra-Uterine Stem Pessary.—Rawls says that the intrauterine stem pessary gives as good end results as other operative procedures for like indications and from its use there is less primary invalidism and no more liability to sequels or morbidity. The intra-uterine stem should never be used except in carefully studied and selected cases and then the minimum of sequels and morbidity with the maximum of results will be obtained.

American Journal of Public Health, Chicago

January, 1921, **11**, No. 1

Birth and Death Certificates as Legal Evidence. H. B. Hemenway, Springfield, Ill.—p. 1.
Evaporation of Fruits and Vegetables. W. V. Cruess, Berkley, Calif.—p. 6.
Sanitary Conditions in Peru. H. Hanson, Lima, Peru.—p. 13.
B. Coli and B. Aerogenes. M. Levine, Iowa City, Ia.—p. 21.
Maintaining Standards of Animal Foods. M. E. Jaffa, Berkeley, Calif.—p. 23.
The Helpless Narcotic: A Public Menace and a Public Health Responsibility. S. Graham-Mulhall, New York City.—p. 25.
Some Recent Experiments in Narcotic Control. C. E. Terry, Darien, Conn.—p. 32.
Rôle of Dentistry in Personal Hygiene. G. S. Millberry, San Francisco.—p. 53.
Mental Health of Children. G. E. Myers, Los Angeles.—p. 55.
Relation of Industrial Medicine to Public Health. R. T. Legge, Berkley, Calif.—p. 62.
Bacteriologic Methods of Water Analysis Used in the American Expeditionary Force. E. Bartow.—p. 65.
Infant Welfare Health Stations in Bridgeport, Conn. L. A. Wilkes, Bridgeport.—p. 66.

American Review of Tuberculosis, Baltimore

February, 1921, **4**, No. 12

*Pleural Infection Complicating Artificial Pneumothorax Treated with Gentian Violet. B. H. Waters, Loomis, N. Y.—p. 875.
*Tuberculosis from Standpoint of Postmortem. H. E. Robertson, Minneapolis.—p. 882.
Albumin Reaction in Sputum. W. Burdick and H. Gauss, Denver, Colo.—p. 889.
Localized Spontaneous Pyopneumothorax; Report of Case with Roentgenographs. S. Sweezey and M. Levy, Denver, Colo.—p. 896.
*Four Years of Framingham Demonstration. D. B. Armstrong.—p. 905.

Résumé of a Tuberculosis Survey of Silk Mill Village in North Carolina. L. B. McBrayer, Sanatorium, N. C.—p. 920.
Child's Place in Tuberculosis Program. H. D. Chadwick, Westfield, Mass.—p. 926.
Coordination of Antituberculosis Agencies. W. C. Klotz, Charlottesville, Va.—p. 933.

Gentian Violet in Pleural Infection.—The occurrence of septic infection of the pleura in two instances, during the course of artificial compression of the lung in pulmonary tuberculosis, led Waters to the adaption to the pleural cavity of a method similar to that which Churchman uses for the knee joint. Within from twelve to twenty-four hours in the first case a marked and striking change for the better was noted, repeated to a lesser degree after the second treatment, the patient subsequently recovering from this serious complication although marked prostration and a low fever persisted, which were associated with a fresh development of tubercle in the opposite lung. The outcome was even more gratifying in the second case.

Healed Tuberculosis.—A case is cited by Robertson which bears on the question of healed tuberculous lesions. A woman, 57 years of age, had suffered in childhood from Pott's disease of the spine, which appeared to have become arrested at the age of 12. For forty-five years she lived without experiencing or revealing any evidences of active tuberculous foci. She finally died of general arteriosclerosis and angina pectoris. The lymph nodes at the bifurcation of her trachea contained calcareous and caseous masses, while adjoining these were young growing tubercles which had evidently sprung into activity only at a very recent date. This illustration gives a basis for the statement that once infected with tuberculosis the patient can never be assured of absolute freedom from its recurrence. It thus well behooves the entire race to live under such safe hygienic conditions that this specific and real menace to its existence may be reduced to its lowest possible terms.

Tuberculosis in Framingham.—Tuberculosis as a cause of illness in Framingham Armstrong says is apparently being brought under control. This is particularly true as reflected in the decreasing number of advanced cases. As to mortality, the tuberculosis death rate per hundred thousand, corrected for certification was 121.5. For the entire demonstration period thus far, with similar corrections, including the rate for 1920, the figure is 84.2 per hundred thousand—a reduction of about one third. For 1920, the rate was 64.5 per hundred thousand—a reduction of about one half under the pre-demonstration rate after four years of intensive work. This rate would mean that the same measures if successfully applied to 100,000 people, with 100 deaths a year at the start, would save fifty lives a year. For the United States as a whole, this would mean a saving of 75,000 lives annually. In Framingham, at the beginning of the demonstration, the community was spending approximately 40 cents per capita per year on all kinds of health work. The community is now spending about $2 per capita per year from public and private funds combined. In a city of 100,000 people this would mean an annual health expenditure of about $200,000.

Annals of Surgery, Philadelphia

February, 1921, **73**, No. 2

*Squamous Cell Epithelioma of Skin. A. C. Broders, Rochester, Minn.—p. 141.
*Painless Hypodermoclysis. W. Bartlett, St. Louis, Mo.—p. 161.
Regional Anesthesia. G. L. Labat, Rochester, Minn.—p. 165.
*Some Surgical Aspects of Asphyxia. E. A. Graham, St. Louis, Mo.—p. 179.
Some Underlying Principles of Intestinal and Gastric Surgery. J. S. Horsley, Richmond, Va.—p. 199.
*Solid Tumors of Mesentery. J. L. Ransohoff and A. Friedlander, Cincinnati, Ohio.—p. 211.
Stave Fracture of First Metatarsal Bone. M. B. Cooperman, Philadelphia.—p. 215.
Tumors in South China. J. O. Thomson, Canton, China.—p. 217.
*Pseudopolycythemia: Extraordinary Blood Changes in Patient with Renal Calculus. L. Herman and B. B. V. Lyon, Philadelphia.—p. 223.
Pertrochanteric Fracture of Femur. P. G. Skillern, Jr., Philadelphia.—p. 227.
*Mesenteric Embolism in Hemophiliac. F. B. Block and S. Goldberg, Philadelphia.—p. 229.

Squamous Cell Epithelioma of Skin.—The 256 cases in the series of squamous cell epitheliomas of the skin studied by Broders represent 12.8 per cent. of 2,000 cases of general epithelioma observed in the Mayo Clinic from Nov. 1, 1904, to July 22, 1915. Farmers represented 53.96 per cent. of the cases in males. The site of the cancer was preceded by a mole, wart, pimple, scab, ulcer, leukoplakia, crack, wen, blister, or lump in 51.17 per cent. of the cases. There was a history of injury in 23.82 per cent. of the cases; burns represented 24.59 per cent. of the injuries, and roentgen-ray burns represented 20 per cent. of the burns. Data of interest are: 78.4 per cent. of all lesions occurred above the clavicle; 28.12 per cent. of the patients were treated with acid, paste or plaster before they entered the clinic; 26.95 per cent. were operated on at the clinic. Regional lymph nodes or salivary glands were not removed in 77.96 per cent. Of the 22.03 per cent. of the cases in which the regional lymph nodes or salivary glands were removed, metastasis was demonstrated in 61.53 per cent. The cervical lymph nodes were involved in 31.25 per cent., the submaxillary lymph nodes in 28.12 per cent., the parotid lymph nodes in 25 per cent., the parotid salivary gland in 25 per cent., and the axillary and inguinal lymph nodes each in 15.62 per cent. Of the patients operated on and traced, 51.77 per cent. are dead; 82.35 per cent. of the living patients have been free from the disease on an average of 7.44 years; 65.51 per cent. died of epithelioma. The actual operative mortality was 0.42 per cent. Patients who were treated with pastes, plaster, etc., before entering the clinic did not get such good total results as those who were not so treated, 57.14 per cent. in the former group and 61.11 per cent. in the latter; the total poor results were 40 per cent. in the former group and 30 per cent. in the latter. Of the patients with metastases, 10.52 per cent. are living. No patient with cervical lymph nodes or more than one group of any lymph nodes involved has been reported living. All the patients reported dead who had metastases died of epithelioma; 66.66 per cent. of the patients reported dead who did not have metastases died of epithelioma; 53.15 per cent. of the patients operated on in whom no regional lymph nodes or salivary glands were removed are living; 81.35 per cent. of these report good results; 54.76 per cent. of the patients reported dead in whom no regional lymph nodes or salivary glands were removed, died of epithelioma. The total good results for the patients with metastasis are 6.66 per cent.; for those without metastasis, 77.77 per cent.; and for those in whom no regional lymph nodes or salivary glands were removed, 66.33 per cent.

Painless Hypodermoclysis.—The vicarious administration of water has been revolutionized in Bartlett's service by the employment of local anesthesia from the beginning to the end of the procedure. He uses 0.05 per cent. procain in great dilution with distilled water. The introduction of a few hundred c.c. of fluid into a partially dehydrated patient to some extent offsets the possible risk of employing what may be considered a toxic dose of the procain which seemed indispensable to the performance of a much needed surgical operation. Bartlett has never observed dangerous toxic symptoms following the employment of procain, although he has far exceeded what is commonly given as the maximum dose. He uses the ordinary proctoclysis apparatus without the drop sight feed attachment. Where hypodermoclysis is used in any of the conditions which are attended by a fall of blood pressure, epinephrin is added to the fluid. It is injected midway between the lower ribs and the prominent upper curve of the ilium as the site of election, since less subsequent damage has occurred here than elsewhere. The introduction of the needle is made painless by an ethyl chlorid spray on the skin. Bartlett considers this method of injecting water into the tissues far superior to proctoclysis, although it is not ideal. Infection or tissue devitalization is possible, and the region affected is quite likely to remain very tender for two or three days, but a continuous inflow of 1/10 per cent. procain can be maintained with most patients, as long as indicated, without causing discomfort or toxic symptoms.

Surgical Aspects of Asphyxia.—Graham discusses the manner in which disturbances of tissue respiration in the human body may occur; the effects of asphyxia, and the recognition of asphyxial effects. Some practical methods of minimizing the effects of asphyxia are presented.

Solid Tumors of Mesentery.—Ransohoff and Friedlander report one case in which the diagnosis was made with the aid

of the roentgen ray. A tumor the size of a fetal head was found in the mesosigmoid, just above the rectosigmoid junction. It was a fibrosarcoma. In none of the fifteen cases recorded in the literature and analyzed by the authors had a diagnosis been made.

Blood Changes in Renal Calculus.—The case recorded by Herman and Lyon presents clinical and cytologic evidence that remarkable functional disturbances sometimes occur in the hemopoietic tissues in the absence of demonstrable organic changes in these tissues, in so far as the clinical demonstration of the latter is concerned. No case in the literature bears on a polycythemia in connection with a kidney condition and disappearing when the kidney was removed. Another unusual feature was the sudden flood of leukocytes, mainly polymorphonuclears, after operation.

Mesenteric Embolism in Hemophiliac.—Several unusual features are stressed by Block and Goldberg in the report of their case. A correct preoperative diagnosis was made; recovery followed the operation; the patient was a true hemophiliac, and a female, aged 45. The symptoms of the mesenteric embolism were; nausea, sudden severe abdominal pain, which was cramplike in character, became aggravated and was associated with almost continuous vomiting. The vomitus consisted of a greenish material at times, and at other times it was very foamy but had no characteristic odor nor did it contain blood. The bowels were constipated, although the patient had taken magnesium sulphate, and an enema had been given. The abdomen was not rigid, but there seemed to be a moderate amount of tenderness in the lower left quadrant, but the pain, while more severe in this region, was general. No mass was palpable nor was there any noticeable distention. The peristaltic movements were well heard. Temperature was normal; the pulse was 110 and there was no increase in the respiratory rate. On opening the abdomen there was a gush of blood-stained fluid followed by the prolapse of a moderately distended intestine into the wound. On passing the hand down to the left lower quadrant a firm mass was felt which proved to be an intensely congested ileum which was on the verge of undergoing gangrene. The mesentery of this portion of the gut presented a picture of infarction. The involved area of gut was about 6 inches in length, the intestines below the diseased area appeared quite normal, while the bowel above showed graduated degrees of congestion, most marked, of course, as it approached the infarcted area. The diseased loop, together with several inches of the congested bowel above the infarct and the accompanying mesentery, was removed.

Arkansas Medical Society Journal, Little Rock

February, 1921, **17**, No. 9

Things Which I Think Would Most Help Physician Financially and Not Do Him Any Professional Damage. E. J. Mason, Jonesboro.—p. 175.
Eclampsia. S. J. Allbright, Kensett.—p. 177.

Endocrinology, Los Angeles

January, 1921, **5**, No. 1

Adenoma of Thyroid with Hyperthyroidism (Thyrotoxic Adenoma). History of Recognition of this Disease as Clinical Entity. Study of Symptomatology with Basal Metabolic Rates. W. M. Boothby, Rochester, Minn.—p. 1.
Case of Dystrophia Adiposogenitalis. F. G. Ebaugh and R. G. Hoskins, Baltimore.—p. 21.
Determination of Relative Activity of Thyroid Lobes. N. W. Brown, Toledo, Ohio.—p. 29.
Hypophysis Cerebri of Woodchuck (Marmota Monax) with Special Reference to Hibernation and Inanition. A. T. Rasmussen, Minneapolis.—p. 33.
Controlling Factors in Amphibian Metamorphosis. J. F. Fulton, Jr.—p. 67.

Illinois Medical Journal, Oak Park

January, 1921, **39**, No. 1

Group Diagnosis and Group Therapy. L. F. Barker, Baltimore.—p. 1.
Nasal Cavities and Asthma. G. E. Shambaugh, Chicago.—p. 10.
Principles of Drainage in Empyema. J. F. Binnie, Kansas City, Mo.—p. 13.
Some Experiences Had in Dealing with Appendicitis During Past Twenty-Five Years. E. M. Sala, Rock Island.—p. 14.
Need and Value of Strict Enforcement of Notification in Cases of Suspected and Diagnosed Pulmonary Tuberculosis. E. J. O'Neill, Chicago.—p. 22.
Treatment of Some Pelvic Inflammations. C. H. Tearnan, Decatur.—p. 25.
Blood Transfusion in New-Born. A. Bamberger, Chicago.—p. 27.
Angina Pectoris Treatment with Benzyl Benzoate. A. B. Spach, Chicago.—p. 28.
*Blood Transfusion in Treatment of Pulmonary Tuberculosis. E. B. Freilich, A. J. Hruby, J. J. Mendelsohn, Chicago.—p. 32.
Precancerous Stage. F. D. Moore, Chicago.—p. 34.
Glaucoma. M. Goldenburg, Chicago.—p. 41.
Surgical Treatment of Gastric and Duodenal Ulcer, with a New Method of Pyloroplasty. A. A. Strauss, Chicago.—p. 45.
Enuresis. J. C. Krafft, Chicago.—p. 50.
Empyema: Dakin—Carrel Technic. F. P. Horan, Evanston.—p. 52.
Andrews Operation for Inguinal Hernia with Report of 316 Cases and Modification of Technic. A. Werelius, Chicago.—p. 53.
Tuberculosis of Abdominal Peritoneum. W. B. Metcalf, Chicago.—p. 57.
Eye in Relation to Diseases of Nose, Throat and Teeth. O. Tydings, Chicago.—p. 59.
Peritoneoscope, Pneumoperitoneum and Roentgen-Rays in Abdominal Diagnosis. B. H. Orndoff, Chicago.—p. 61.

Blood Transfusion in Pulmonary Tuberculosis.—The transfusion of blood has been resorted to by the authors in a series of cases at the Chicago Municipal Tuberculosis Sanitarium. The blood of the donor and recipient are tested for iso-agglutinins and isohemolysin, Wassermann tests for syphilis, and complement fixation tests for tuberculosis. In addition the cytology of the blood of the recipient is studied weekly. The transfusion is done by the indirect method at weekly intervals. The recipients are patients in whom the prognosis is doubtful or bad, who are not improving under the usual methods of treatment and are classified as Moderately Advanced B and C, and Far Advanced A and B, according to the classification of the National Tuberculosis Association. Six patients have received from two to five transfusions at weekly intervals of from 100 to 375 c.c. of blood. Transfusion of over 200 c.c. usually resulted in a reaction characterized by chill, fever and sweat with prompt recovery therefrom. The clinical course in this series of cases was not appreciably altered. Changes in the blood of the recipients in this series was a steady deviation to the left or no change as determined by Arneth count. In conclusion, it is evident that normal blood is devoid of that specific element which will arrest the progress of the disease. Further experimental work is now being carried on with a series of cases in which the donors show a positive complement fixation test for tuberculosis.

Indiana State Medical Association Journal, Ft. Wayne

Jan. 15, 1921, **14**, No. 1

Rôle of Roentgen Ray in Diagnosis of Surgical Abdomen with Special Emphasis on Its Use in Gallbladder and Appendiceal Regions. B. R. Kirklin, Muncie.—p. 1.
The Physician: "The Medical Society." F. B. Wynn, Indianapolis.—p. 7.
Suture of Peripheral Nerves. W. C. Moore, Muncie.—p. 11.

Iowa State Medical Society Journal, Des Moines

Feb. 15, 1921, **11**, No. 2

*Operative and Nonoperative Indications in Surgical Tuberculosis. A. Steindler, Iowa City.—p. 33.
Some Aural Complications of Acute Epidemic Parotitis. G. C. Albright, Iowa City.—p. 38.
Work of Women Physicians During War. N. S. Noble, Des Moines.—p. 44.
Early Recognition and Treatment of Intussusception. C. S. Krause, Cedar Rapids.—p. p. 47.
Diet for Pernicious Anemia. R. L. Fenlon, Iowa City.—p. 50.

Treatment of Surgical Tuberculosis.—Among 4,600 cases, Steindler has observed 350 cases of joint tuberculosis, about 7 per cent. Of these cases 253 were treated; twenty-eight were treated operatively and 225 conservatively. As result of his experience Steindler feels that the first thing that deserves warmest advocacy is the securing of all facilities necessary to carry out general treatment especially that of heliotherapy and outdoor life. Barring a few patients in especially favorable circumstances this should mean institutional treatment for the majority of cases. Severe cases of either Pott's disease or hip disease or shoulder disease will do better in recumbency that in ambulatory treatment and the general trend should be more toward prolongation of recumbency. While the division of indications into conservative and operative treatment largely parallels the division into adults and juvenile tuberculosis, there are operative indications for radical interference in children, which, if undertaken at all, should be done at an early time. The best results

are obtained by a long period of institutional care so that both recumbent and general hygienic treatment may be administered thoroughly and systematically.

Journal of Biological Chemistry, Baltimore

February, 1921, 45, No. 3

Removal of Ammonia from Urine Preparatory to Determination of Urea. G. E. Youngburg, Buffalo.—p. 391.
Chemical Study of Several Marine Mollusks of Pacific Coast. P. G. Albrecht, Palto Alto, Calif.—p. 395.
Hemicellulose of Apple Wood. W. E. Tottingham, R. H. Roberts, and S. Lepkovsky, Madison, Wis.—p. 407.
*Estimation of Bile Acids in Bile. C. L. A. Schmidt and A. E. Dart, Berkeley, Calif.—p. 415.
*Effect of Alkali on Efficiency of Water-Soluble Vitamin B. T. B. Osborne and C. S. Leavenworth, New Haven, Conn.—p. 423.
Method for Determination of Chlorin in Solid Tissues. R. D. Bell and E. A. Doisy, Boston.—p. 427.
*Determination of Chlorids in Trichloroacetic Acid Filtrates from Whole Blood and Plasma. M. Smith, Boston.—p. 437.
*Simplified Method for Determination of Chlorids in Blood or Plasma. J. C. Whitehorn, Boston.—p. 449.
Determination of Chlorids in Blood Plasma. J. H. Austin and D. D. Van Slyke, New York.—p. 461.
Improved Apparatus for Use in Folin and Wu's Method for Estimation of Urea in Blood. T. Watson and H. L. White, Los Angeles.—p. 465.
Chemical Structure of Chondridin. P. A. Levene and J. Lopez-Suarez, New York.—p. 467.
*Sulphocyanate Content of Saliva and Urine in Pellagra. M. X. Sullivan and P. R. Dawson, Spartanburg, S. C.—p. 473.
*Carbon Dioxid Absorption Curve and Carbon Dioxid Tension of Blood of Normal Resting Individuals. J. P. Peters, Jr., D. P. Barr and F. D. Rule, New York.—p. 489.
*Carbon Dioxid Absorption Curve and Carbon Dioxid Tension of Blood in Cardiac Dyspnea. J. P. Peters, Jr., and D. P. Barr, New York.—p. 537.
*Carbon Dioxid Absorption Curve and Carbon Dioxid Tension of Blood in Severe Anemia. D. P. Barr and J. P. Peters, Jr., New York.—p. 571.
Possible Asymmetry of Aliphatic Diazo Compounds. P. A. Levene and L. A. Mikeska, New York.—p. 593.

Estimation of Bile Acids in Bile.—A method for the estimation of the nitrogen of bile acids of the taurine and the glycocoll series in bile is described by Schmidt and Dart. It is based on the fact that on hydrolysis with sodium hydroxid the bile acids are split, setting free taurine and glycocoll which react quantitatively with nitric acid. The taurine nitrogen can be estimated from the total sulfur content of protein-free bile. The difference between the amino nitrogen resulting from the splitting of the bile acids, and the taurine nitrogen, less 3 per cent., gives the glycocoll nitrogen.

Effect of Alkali on Vitamin B.—The experiments made by Osborne and Leavenworth confirm the observations of those investigators who have reported the destruction of the water-soluble vitamin B when heated with alkalies. It thus appears that in attempting to concentrate, or isolate, the water-soluble vitamin B dilute alkaline solutions can be used without materially affecting its activity provided a low temperature and a short time of exposure to the alkali are employed.

Determination of Blood Chlorids.—The determination of blood chlorids by several different methods is discussed by Smith. It is pointed out that the simultaneous precipitation of blood proteins and chlorids is open to error. A modification of the McLean-Van Slyke starch-citrate-nitrite solution is introduced. The use of trichloroacetic acid filtrates for determination of chlorids is described.

Determination of Blood Chlorids.—The method of preparing protein-free filtrates by the use of tungstic acid, as developed and used by Folin, was applied by Whitehorn to the determination of chlorids. The same reagents as are used for the determination of urine chlorids are employed. The limit of error is less than 1.5 per cent.

Sulphocyanate Content of Saliva and Urine of Pellagrins.—Examination of the saliva and urine of pellagra patients showed that the sulphocyanate content is, as a rule, less than that of the saliva and urine of the same patients about to be discharged from the hospital as being free from the signs and symptoms characteristic of pellagra. The increase of the sulphocyanate of the saliva and urine seems to be associated with the betterment of the general condition of the patient, with better assimilation, a higher protein metabolism, and presumably a greater detoxifying power of the system as a whole. The increase of sulphocyanate of the urine at discharge, over that of entrance, however, is not proportional to the increase of the total nitrogen of the urine.

Carbon Dioxid Tension of Blood.—A direct method for the estimation of the arterial and venous carbon dioxid tension of human blood is described by Peters and his associates. It has been employed on three normal subjects at rest.

Carbon Dioxid Tension of Blood in Cardiac Dyspnea.—A study has been made by Peters and Barr of the carbon dioxid absorption curve of the blood of seven patients with cardiac decompensation and dyspnea. In three out of the seven low curves were found. In two of these cases the curves returned to the normal level when compensation was restablished. Clinically, these patients were distinguished by the presence of an extreme degree of cyanosis with little dyspnea. No relation could be established between the reduction of the absorption curve and the oxygen unsaturation of the arterial or venous blood. A low absorption curve was not an indication of the severity of the condition. No signs of renal involvement were discovered in any of these cases. The causes of cardiac dyspnea seem to be: The fact that a greater ventilation is necessary to effect the normal carbon dioxid elimination. This is largely brought about by an impairment of the efficiency of the pulmonary mechanism for the exchange of gases between the blood and the outside air. This necessitates the maintenance of a greater difference in carbon dioxid pressure between the blood in the pulmonary circulation and the alveolar air in order to effect the normal carbon dioxid output. To maintain the carbon dioxid tension and the hydrogen ion concentration at the proper level the alveolar carbon dioxid tension must be abnormally low. In some cases a diminution of the circulation rate may be an additional factor in the production of a carbon dioxid acidosis. Finally, in a certain proportion of the cases, at least, there is a real reduction of the available alkali of the blood. In at least two cases with a reduction of the vailable alkali of the blood were found indications of a comparative insensibility of the respiratory center to its natural physicochemical stimulus, the hydrogen ion concentration of the blood.

Carbon Dioxid Absorption Curve in Anemia.—The carbon dioxid absorption curves of blood from six patients with severe anemia have been studied by Barr and Peters. They have been found to have a flatter slope than have the curves of normal blood. This is explained, in part, by the low percentage of hemoglobin. The flatness of the curves, however, is not exactly proportional to the diminution in the percentage of hemoglobin. The blood of severe anemia has a diminished power of absorbing or dissociating carbon dioxid with changes of carbon dioxid tension. In three cases the hydrogen ion concentration of the arterial blood was determined and found to be relatively low, the p_H being as much as 7.47 in one instance. The venous p_H was surprisingly constant, varying in four cases between 7.32 and 7.38. In severe anemia changes in carbon dioxid tension produce relatively small changes in carbon dioxid content and relatively great variations in hydrogen ion concentration. The fault in the carbon dioxid carrying power and the greater changes in hydrogen ion concentration may explain the dyspnea of anemia.

Journal of Experimental Medicine, Baltimore

Feb. 1, 1921, 33, No. 2

*Experimental Studies of Nasopharyngeal Secretions from Influenza Patients. I. Transmission Experiments with Nasopharyngeal Washings. P. K. Olitsky and F. L. Gates, New York.—p. 125.
*Chilomastix Mesnili and Method for Its Culture. W. C. Boeck, Baltimore.—p. 147.
*Mechanism of Urea Excretion. J. Oliver, San Francisco.—p. 177.
*Immunologic Distinctions of Encephalitis and Poliomyelitis. H. L. Amoss, New York.—p. 187.
*Therapeutic Action of N-Phenylglycineamid-p-Arsonic Acid (Tryparsamid) on Experimental Infections of Trypanosoma Rhodesiense. L. Pearce and W. H. Brown, New York.—p. 193.
*Acid-Base Equilibrium in Disease from Point of View of Blood Gases. J. H. Means, A. V. Bock and M. N. Woodwell, Boston.—p. 201.
Relation Between Virulence of Streptococci and Hemolysin. F. A. Stevens, J. W. S. Brady and R. West, New York.—p. 223.
Quantitative Distribution of Particulate Material (Manganese Dioxid) Administered Intravenously to Dog, Rabbit, Guinea-Pig, Rat, Chicken and Turtle. C. C. Lund, L. A. Shaw and C. K. Drinker, Boston.—p. 231.
*Experimental Studies on Yellow Fever in Northern Peru. H. Noguchi and I. J. Kligler, New York.—p. 239.
Immunology of Peruvian Strains of Leptospira Icteroides. H. Noguchi and I. J. Kligler, New York.—p. 253.
Migration of Lymphocytes in Plasma Cultures of Human Lymph Nodes. W. H. Lewis and L. T. Webster, Baltimore.—p. 261.

Studies on Endothelial Reactions. IV. Endothelium in Experimental General Miliary Tuberculosis in Rabbits. N. C. Foot, Boston.—p. 271. Condition of Capillaries in Histamin Shock. A. R. Rich, Baltimore.—p. 287.

Study of Nasopharyngeal Secretions in Influenza.—The object of the investigation made by Olitsky and Gates was to determine, if possible, whether the secretions of the nasopharynx of individuals suffering from epidemic influenza exhibited on inoculation into animals any peculiarities of action or properties which would serve to distinguish them from the secretions of individuals not so affected. An active substance has been detected in five patients in early stages of epidemic influenza during 1918-1919, and two patients in early stages of epidemic influenza during 1920. It was not detected in twelve cases of the same disease in which the onset of obvious symptoms occurred more than thirty-six hours before washing of the nasopharynx was carried out, nor was it found in the secretions of fourteen individuals free from the syndrome of influenza either during the epidemics or the interval between them. With this substance a clinical and pathological condition has been induced in rabbits, affecting the blood and pulmonary structures mainly, which could be maintained and carried through at least fifteen successive animals. For this reason, and also because of the dilution between passages, the authors believe they were dealing with the actual transmission of a multiplying agent rather than with a passive transference of an original active substance.

Diarrhea Due to Flagellate.—A chronic case of diarrhea due to a flagellate infestation was brought to Boeck's notice and on examination the flagellate was identified as *Chilomastix mesnili*. It was cultured continuously from Jan. 27 to June 15, 1920, in an artificial medium composed of one part of human serum and four parts of Locke's solution with the addition of a small amount of dextrose. Boeck claims that cases of flagellate infection of man by *Chilomastix mesnili* have been reported from nearly every locality in the world. They are often confused with cases of infestation by *Trichomonas intestinalis*.

Mechanism of Urea Excretion.—The mechanism of urea excretion is summarized by Oliver as follows: Urea passes through the glomerular capsule in the same concentration as that found in the plasma. A certain amount is added to this filtrate by excretion through the cells of the proximal convoluted tubule, and the ultimate concentration is reached by an absorption of water in the remainder of the tubule. Urea is present in the cells of the proximal convoluted tubule in a concentration higher than that of the blood or than that of the cells of any of the other kidney tubules. Such a condition can only be reconciled to an assumption of an active secretion (excretion) on the part of these cells. Urea also passes through the glomerular filter with the other crystalloids of the blood plasma. The final concentration of urea is due to the above mentioned secretion by the proximal convoluted tubule, and to the absorption of water in other parts of the tubule.

Immunologic Distinction of Encephalitis and Poliomyelitis.—Experiments made by Amoss show that the two diseases can be distinguished through the power of blood serum under certain circumstances to neutralize the virus of poliomyelitis. The blood serum of convalescent cases of poliomyelitis whether in man or monkey possesses this neutralizing power, while the blood serum of recently convalescent cases of epidemic encephalitis is devoid of it. On the basis of the distinguishing characters described, it is regarded as desirable at the present time to hold epidemic poliomyelitis and epidemic encephalitis as integrally distinct affections. The latter also may be infectious, yet the main lesions of poliomyelitis are present in the spinal cord, and of epidemic encephalitis in the midbrain.

Value of Tryparsamid in Sleeping Sickness.—The facts presented indicate that the outlook for the value of tryparsamid in the therapy of rhodesian sleeping sickness is much less hopeful than in gambiense infections, though it is felt that some benefits may be derived from its use.

Acid-Base Equilibrium in Disease.—Carbon dioxiddiagrams have been constructed by the authors for the blood of a series of hospital patients as a method of studying disturbances in their acid-base equilibrium. A diabetic with a low level of blood alkali, but with a normal blood reaction, a compensated acidosis in other words, showed a rapid return toward normal with no treatment but fasting and increased water and salt intake. A nephritic with a decompensated acidosis and a very low blood alkali was rapidly brought to a condition of decompensated alkalosis with a high blood alkali by the therapeutic administration of sodium bicarbonate. It is suggested that the therapeutic use of alkali in acidosis is probably only indicated in the decompensated variety, and that there it should be controlled carefully and the production of alkalosis avoided. The diagram obtained in three pneumonia patients suggested that they were suffering from a condition of carbonic acidosis, due perhaps to insufficient pulmonary ventilation. In two out of three cases of anemia the dissociation curve was found to lie at a higher level than normal.

Yellow Fever in Peru.—This report deals with the results of bacteriologic studies at Payta, Piura, and Morropon extending over a period of three months, March, April and May, 1920. A few points of practical significance appeared in the course of the investigation. One is the importance of using fresh rabbit serum for a culture medium. Old rabbit serum, whether in pure form or incorporated with agar, etc., which had been kept for several months in a tropical climate, proved to be unsatisfactory for obtaining a growth of *Leptospira icteroides*. A second point of interest is the variation in susceptibility of guinea-pigs to infection with *Leptospira icteroides*. In two of four series of positive animal inoculations, only one half of the guinea-pigs inoculated with given materials developed typical symptoms.

Journal of Orthopaedic Surgery, Lincoln, Neb.

February, 1921, **3**, No. 2

Joint Range. W. H. Robinson, Pittsburg.—p. 41.
Stoffel's Operation for Spastic Paralysis, Report of Thirty-Two Cases. A. B. Gill, Philadelphia.—p. 52.

Medical Record, New York

March 5, 1921, **99**, No. 10

Typhus Fever and Quarantine. A. H. Doty, New York.—p. 379.
Determinants of Morbid Emotionalism. T. Williams, Washington, D. C.—p. 382.
Acute Purulent Otitis Media in Children. J. G. Callison, New York.—p. 386.
Concept of Roentgen-Ray Pathology. VIII. Odontopathies. A. J. Pacini, Washington, D. C.—p. 390.
Some Fallacies of Christian Science. G. F. Boehme, Jr., Los Angeles.—p. 395.
Hydrocele in Children. M. Quackenbos, New York.—p. 398.

So. Carolina Medical Association Journal, Greenville

January, 1921, **16**, No. 1

Cervical Disease as a Cause of Leukorrhea. J. R. Sparkman, Spartanburg.—p. 5.
Suggestions for Postgraduate Course in Medicine for County Societies. B. B. Steedley, Spartanburg.—p. 8.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

January, 1921, **8**, No. 31

Education of Surgeon Under Thomas Vicary. D. Power.—p. 240.
Clinical Types of Baghdad Boil (Cutaneous Leishmaniasis). Z. Cope.—p. 259.
*Experimental Investigation of Results of Linear Division of Pyloric Sphincter. C. A. Pannett.—p. 262.
Operative Procedure for Repair of Collateral Ligaments of Knee-Joint. A. H. Edwards.—p. 266.
*Treatment of Stiff Metacarpophalangeal Joints Where There is no Gross Bony Alteration. J. A. Dickson, Birmingham.—p. 272.
*Regional Anesthesia, with Special Reference to Splanchnic Analgesia: New Method Applicable to Abdominal Surgery. G. Labat.—p. 278.
*Benign and Malignant Changes in Duct Epithelium of Breast. G. L. Cheatle.—p. 285.
Surgery of Spleen. B. Moynihan.—p. 307.
Case of Ascites Due to Chronic Intussusception of Several Month's Duration. F. M. Spencer.—p. 366.
Case of Gastrojejunocolic Fistula with Stercoraceous Vomiting, Following Gastro-Enterostomy. J. Marnoch.—p. 368.
Perforation of Ureter Calculus: Extravasation of Urine: Death from Uremia and Sepsis. J. Berry.—p. 372.

Papilloma of Bladder of Unusual Size. J. Berry.—p. 374.
Case of Tonsillar Calculus of Unusual Size. G. S. Woodman.—p. 375.
Congenital Abnormality of Female Genito-Urinary Organs. H. Burrows.—p. 377.
Two Cases of Intestinal Obstruction Due to an Enterolith; with Reports of Chemical Analysis. J. Phillips.—p. 378.

Linear Division of Pyloric Sphincter.—Pannett reports on the results of a study made to determine the immediate and remote affects on the normal stomach of a division of the pyloric sphincter without injury to the mucosa. The operation leads to a certain initial increase in the rate of passage of food through the stomach, and a probable earlier complete evacuation of this viscus. These effects may be temporary or permanent according to the method of healing of the wound.

Treatment of Stiff Metacarpophalangeal Joints.—The principle of the treatment discussed by Dickson is that the metacarpophalangeal joints are gradually flexed with plaster; then, by means of the "retaining splint," this flexion is maintained between the massage treatments until there is full voluntary flexion and no tendency to relapse. The ability to flex the joints voluntarily and retain the flexion is the indication for the removal of the splint. If, with freedom, there is any tendency towards limitation of the flexion obtained, the splint must be reapplied for further period.

New Method of Splanchnic Analgesia.—Adopting the site of injection advised by Naegeli, Labat has devised a technic by means of which a complete local anesthesia is obtained, and thus all operations on the upper part of the abdominal cavity can be performed painlessly. A full description of this method is given. Procain is used, a 1 per cent. solution to which is added epinephrin, 25 drops per hundred c.c. For splanchnic analgesia, the site of injection is just underneath the lower border of four fingerbreadths, or 7 cm. from the middle line of the back. The needle is introduced obliquely forward, so that it makes an angle of about 45 degrees with the median plane. Its point then strikes the body of the vertebra near its anterior convexity, behind the splanchnic nerves, just where these join the semilunar ganglion. When the needle, introduced for about 9 cm., had struck the bone, it should be drawn back until its point lies in the subcutaneous tissue (so as to be able to change its direction), and reintroduced at a smaller angle. If its direction is good, the needle passes tangentially to the body of the vertebra. As soon as the point of the needle is felt to glide along the surface of the vertebra, it should be pushed in 1 cm. further; and, after making sure that no blood comes out of the needle, the solution is injected from 25 to 33 c.c.

Diagnosis of Breast Tumor.—For the purpose of diagnosis Cheatle calls attention to the following points. A patient's idea of the time passed since she first noticed the lump in her breast is often inaccurate. Her statement of a discharge of blood or clear fluid from the nipple is trustworthy. A large or a small solitary solid tumor not puckering the skin may be a duct adenoma, a sarcoma, or duct cancer; enlarged glands in the axilla would justify a diagnosis of the last, and were it coupled with a discharge of blood or serum from the nipple this would more definitely confirm the diagnosis. The malignancy of this type varies enormously. It is always important, but in some cases it may be intensely malignant. Cancer in two breasts of the same patient, although not a common occurrence, is very well known to exist. In those patients where it has existed, and whose breasts Cheatle has been able to examine, the cancer has been of the duct-cystic type in both breasts.

British Medical Journal, London

Jan. 29, 1921, **1**, No. 3135

*Theory of Disturbed Reflexes in Production of Symptoms of Disease. J. Mackenzie.—p. 147.
*Histopathology of Epidemic (Lethargic) Encephalitis. C. Da Fano.—p. 153.
"Harlequin Fetus" (Hyperkeratosis Congenitalis). J. T. McAuslin.—p. 155.
Rotation-Dislocation of Astragalus. R. Ollerenshaw.—p. 155.
Probable Identity of Rickettsia Prolculi with Rickettsia Quintana. A. Bacot.—p. 156.
Dextrose in Cardiac Failure. G. S. MacGregor.—p. 158.
Tuberculous Hemarthrosis of Knee. J. A. C. Macewen.—p. 158.
Abdominal Tumor Following Injury to Thorax. F. J. Strachan.—p. 158.
Glandular and Pulmonary Tuberculosis. W. Williams.—p. 158.

Disturbed Reflex in Production of Symptoms.—In many diseases, Mackenzie says, all the symptoms on which a diagnosis is based are reflex in origin—in some the reflexes are disturbed by the entrance of the stimulus through the nervous system, and in others the disturbance is through the circulation. To the former belong the symptoms of such diseases as gastric ulcer, renal calculus and gallstone disease. The symptoms in infections are due to the disturbance of the reflexes through the circulation, as influenza, malaria, typhoid and typhus fevers, measles and abscess formation, apart from the swelling. In some diseases there is a mixture of both kinds of reflexes, as in appendicitis, where there is not only the local pain and tenderness of the tissues of the external body wall, with contraction of the muscles of the abdomen, but the feeling of exhaustion, rapid pulse, tendency to vomit. In cholecystitis a similar complex is present. The need for the more accurate recognition of symptoms is seen when it is considered how difficult it is to diagnose even such seemingly simple affections as gastric ulcer and appendicitis. Though surgeons have been operating for these complaints for many years, the most experienced recognize that in many cases they find they have been mistaken in their diagnosis. This is due in a great measure to the fact that the nature and mechanism of the symptoms of these diseases have never been understood, and the symptoms were never clearly differentiated from those of other diseases which they resemble.

Histopathology of Epidemic Encephalitis.—In the nervous tissue from cases of epidemic (lethargic) encephalitis within and without the nerve cells minute forms have been observed by Da Fano to all appearance consisting of a central, generally basophil, particle and of a delicate little stainable body, irregularly round or oval in shape. For these forms the term "minute bodies" is pro tempore proposed. The bodies are generally discrete, and provided with one granule, but dumbbell-shaped forms occur as well as others with two central particles arranged in pairs. And as yet not quite definable relation seems to exist between these form and a granular, pigment-like material occurring within the nerve cells in places where brown or black pigment is not generally found. Minute forms, similar in shape, structure, and staining properties to those observed in the nervous tissue, have been traced within and without the cells infiltrating a salivary gland from an acute case of the disease. After discussing the supposition that such findings might be the product of an optical illusion, associated perhaps with degenerative changes caused by the malady, the suggestion is tentatively put forward that they may be due to the presence in the tissues of a living agent, cause of the disease.

Feb. 12, 1921, **1**, No. 3137

Muscle Tonus, Tonic Rigidity, and Tonic Fits. J. P. Stewart.—p. 217.
Diathermy in Diseases of Throat and Nose. W. J. Harrison.—p. 220.
*Maternity Hospital; Its Antenatal and Neonatal Departments. J. W. Ballantyne.—p. 221.
Treatment of Uterine Hemorrhage Not Associated with Pregnancy. J. Phillips.—p. 224.
*Prevention of Pulmonary Tuberculosis. H. C. Given.—p. 225.
Relation of Temperature to Onset of Cardiac Irregularity. R. M. Wilson.—p. 226.
*Herpes-Varicella Infection. A. E. Carver.—p. 227.
Association of Herpes Zoster and Varicella. W. M. Robson.—p. 228.
Case of Tetanus. L. T. Challenor.—p. 228.
Massage of Heart and Resuscitation. C. L. Hewer.—p. 228.

Maternity Hospital.—A neonatal ward and clinic, an antenatal clinic, and a prematernity ward, Ballantyne says, are all needed in order to complete a modern maternity hospital in its rounded fullness. Gynecologic and pathologic departments may be added to the building or may be provided elsewhere, according to the requirements or the institutional resources of the city or town in which the maternity hospital is situated. These features will increase the responsibilities of the hospital as a teaching center. The teaching of theoretical obstetrics will in turn be similarly affected. The lecturer will be led to give and pay more time and attention to antenatal diagnosis and pathology and to neonatal hygiene and disease than he commonly does now. The gynecologic department of a maternity hospital would serve the same purpose for the wounded puerperal woman which the neonatal department discharges for the delicate infant.

Prevention of Pulmonary Tuberculosis.—Given emphasizes that the campaign against consumption must be directed

against the air-borne diseases as a whole, and against the common cold in particular. The effects of other respiratory infections, including the common cold and zymotic diseases, in early life is to prepare the soil for the later invasions of the tubercle bacillus when otherwise resistance should be high. The remedy for all these diseases is a matter of improved housing and education in ventilation and general hygiene, yet at the same time much could be done meanwhile by the more thorough recognition and treatment of the common cold and its sequels.

Herpes-Varicella Infection.—Carver cites three cases of varicella in which the only source of infection was the children's grandmother who had a very severe attack of supra-orbital herpes. Contact with any case of varicella can be excluded. The suspicion is very strong that the herpes was the source of their infection. In these cases the herpes-varicella interval was respectively, seventeen, nineteen and twenty days from the first appearance of the herpetic eruption. It appars therefore that sometimes at all events, herpes zoster is an infectious disease, contact with which is not rarely followed by varicella.

Feb. 19, 1921, 1, No. 3138

Vaccine Therapy in Regard to General Practice. A. Fleming.—p. 255.
*Serologic Characters of Disease Producing Pneumococci. R. R. Armstrong.—p. 259.
*Exomphalos, or Hernia into Umbilical Cord. R. Tennent.—p. 263.
*Cure of Hemorrhoids without Operation. J. C. Lyth.—p. 265.
Rerection of Intestine for Acute Intussusception: Two Cases of Recovery. A. H. Southam and C. H. Crawshaw.—p. 266.
*Complete Heart Block in a Case of Diphtheria. R. C. Allen.—p. 267.
Torsion of Testis in an Infant. W. G. Nash.—p. 267.
Treatment of Local Leishmaniasis. E. J. E. Risk.—p. 267.

Serology of Pneumococci.—The relative prevalence in Great Britain of the three recognized American types of pneumococcus was investigated by Armstrong. He found that the American type pneumococci are responsible for disease in this country and have a similar distribution. Seeing that the Type I coccus is responsible for many typical cases of lobar pneumonia in adults, and that this infection must be widely distributed, it is remarkable that this type does not appear to cause disease in childhood. The pneumococci responsible for disease in young children have been found to belong almost uniformly to Type II. In only one case has a Type I coccus been isolated from a child. Type III has a limited distribution in the upper respiratory tract in disease; the only specimen was derived from a mastoid abscess with pneumococcal meningitis. Certain pneumococci did not agglutinate with the three type serums. These may possibly be referable to the heterogeneous Group IV. The principle adopted in the preparation of agglutinating serums has been the intravenous injection of standard phenolated suspensions of the selected coccus in increasing doses at intervals of forty-eight hours, and throughout only a single strain has been employed for each rabbit. Satisfactory serums possessed of the property of completely agglutinating their homologous coccus, and subsequently other cocci belonging to the same group in dilutions of 1 in 80 in twenty-four hours at 55 C., were obtained in the case of a Type I strain derived from a case of typical lobar pneumonia referred to as Type I "A" and in that of the American Type III coccus from the Lister Institute. The American Type II coccus proved a failure for agglutinogenic purposes, and recourse was had to a series of Type II cocci from definite tissue sources in cases of pneumococcal infection.

Hernia Into Umbilical Cord.—Tennent records five cases. One case, occurring in a baby, aged 4 months, illustrates an almost spontaneous cure of a small exomphalos. The contents of the hernial sac in these cases were cecum, appendix and Meckel's diverticulum. The cause of exomphalos is held to be most likely a defect in the development or function of the mesoblastic layer of the abdominal wall. Treatment, to be successful, must be immediate and consists of open operation.

Cure of Hemorrhoids Without Operation.—Lyth claims that the usual palliatives to some extent relieve pain, but do little to stop the bleeding and nasty mucus discharge. Lyth says there is a means of curing piles, in the sense that they can be made entirely innocuous. He uses calamine powder. After the motion, and after gentle sponging with tepid water, calamine powder is freely and thickly placed (not merely sprinkled) on a sanitary wool and gauze pad which is put in contact with the piles. After a time, probably not more than a fortnight or three weeks even in the bad cases the piles will be sufficiently shrunken and dried and painless by the morning for the daily pad to be dispensed with. Meanwhile, those of the piles normally inside, but which prolapse on defecation, are coming into contact with the calamine before their gradual return during the night, and, subjected to its astringent action, are becoming smaller and less sensitive. After a further lapse of two or three weeks the patient can begin to leave off the pad at night, unless he has been either too constipated or too relaxed. He is then in a fair way to being cured. He must always have his bowels moved at night, and he is wise to have calamine and a pad available.

Heart Block in Diphtheria.—Allen's patient was apparently doing quite well, until the seventh day of disease, when heart block suddenly developed. The case presented unusual difficulties both in treatment and prognosis. The patient died.

Glasgow Medical Journal

February, 1921, 13, No. 2

Enteric Fevers in British Expeditionary Force, 1914-1918. W. B. Leishman.—p. 81.
Medical Education, Legislation and Practice in United States. N. Walker.—p. 110.
*Case of Acute Myoclonic Encephalitis Presenting Some Unusual Features. W. Scott.—p. 126.

Acute Myoclonic Encephalitis.—The outstanding features of the case cited by Scott were: The temperature remained normal throughout the illness, with the exception of a rise to 102.2 F. following lumbar puncture. The pulse averaged 120, the respirations 22 per minute. There were continuous clonic movements of the abdominal muscles on both sides, and early loss of abdominal reflexes. The spasmodic contractions were most marked on the right side of the body, and the main lesion was localized in the lower portion of the left precentral gyrus. There was continuous bleeding from the nasal and buccal mucous membranes; marked constipation and retention of urine. The patient died. At the postmortem examination, a band of meningo-encephalitis was noted, extending over the left Rolandic area, and a similar condition was present in the corresponding area on the right side of the brain. The inflammation was especially marked over the lower portion of the precentral gyrus on both sides, that on the left being more intense.

Journal of Laryngology and Otology, Edinburgh

February, 1921, 36, No. 2

Angeioma of Larynx. I. Moore.—p. 49.
Head Nystagmus in Human Beings. S. H. Mygind.—p. 72.

Lancet London

Feb. 19, 1921, 1, No. 5086

Astley Cooper and Hunterian Principles. C. J. Symonds.—p. 359.
Skin Disease in Relation to Internal Disorder. J. Galloway.—p. 364.
Lethargic Encephalitis. W. St. C. McClure.—p. 369.
Case of Osteitis Deformans. D. C. Hare and C. C. Bernard.—p. 371.
*Auricular Fibrillation: Observation of Four Hundred Cases. D. S. Brachman.—p. 374.
Percentage of Fractional Dilutions. B. Blacklock.—p. 377.
Noninfective Thrombosis of Pelvic and Abdominal Veins. R. J. Morris.—p. 377.
Second Attack of Chickenpox. F. H. Thomson.—p. 378.
"Sternohyoid" Artery. L. Rogers.—p. 378.
Case of Chronic Hydrocephalus Simulating Hysteria. M. S. Monier-Williams and H. Ingleby.—p. 378.

Auricular Fibrillation.—Of the 400 cases analyzed by Brachman, 66 per cent., occurred after 40 years, the largest number, 28 per cent., occurring between 41 and 50 years. Rheumatic fever is by far the commonest antecedent disease in auricular fibrillation, being found in 35 per cent. There was a history of no previous illness in 19 per cent. Forty-six cases gave a history of influenza. The commonest symptom was dyspnea. The next two symptoms commonly met with were pain (under or across the heart and palpitation. Among the less usual symptoms, cough is twice as common, and insomnia four times as common in fibrillation as in non-fibrillation cases. While nervousness is objectively common, it is but seldom complained of as a symptom. Subjective

feeling of irregular beating of the heart has been mentioned as a common symptom, but in this series it was comparatively rare. Associated valvular lesions and myocardial disease occurred frequently. The most common was mitral stenosis, which was present in 37 per cent. The sign most commonly found in auricular fibrillation, next to irregular irregularity of rhythm, is enlarged heart, particularly the auricles being so. The three signs of auricular fibrillation emphasized are: (1) complete irregularity of the heart; (2) increase of the cardiac diameter, and (3) a difference in apex and pulse rate. The main object to be achieved when treating auricular fibrillation is to adjust the rate of the ventricles so as to produce an adequate circulation without undue ventricular work. The great therapeutic agent is rest—physical, mental and cardiac.

Bulletin Médical, Paris

Jan. 15, 1921, **35**, No. 3

*Typhoid Fever. C. Flandin and J. Lempérière.—p. 37.
*Femoral Hernia. T. Asteriadès.—p. 38.
Preparatory Iridectomy. A. Cantonnet.—p. 40.

Typhoid.—Flandin and Lempérière apply ice to the whole abdomen and sometimes to the precordial region and give a cold drip enema, morning and evening, of 1 or 2 liters of artificial serum with glucose and a trace of epinephrin. They supplement this with an iodized vaccine (Ranque and Senez). They state that the course of the disease has been materially shortened by this treatment which does not interfere with the patient's repose.

Femoral Hernia.—The obliteration of the femoral canal is realized by passing a needle through Poupart's ligament and deep through the pectineus muscle and back again. The loop of the thread is then tied, and above this a flap of fascia and another of muscle are held in place with catgut.

Jan. 19-22, 1921, **35**, No. 4

*Pressure of the Cerebrospinal Fluid. J. A. Barré and R. Schrapf.—p. 63.
Massage of the Prostate. R. Le Fur.—p. 65.

Pressure in the Cerebrospinal Fluid.—From study of the pressure at lumbar puncture in 310 cases, Barré and Schrapf estimate that the normal pressure, measured with the Claude manometer, is 20 cm. when the subject is reclining, and 40 cm. seated, with the head drooping. Raising the head in the second position sends up the pressure from 5 to 10 cm. They consider every pressure pathologic which is over 25 cm. reclining, and over 45 cm. seated. In order to estimate the pressure in a given case, the position of the patient during the puncture must be specified; also whether he is tranquil or agitated, and whether the pulse varies in frequency or force during the puncture. Their observation suggests further that the difference between the initial and the terminal pressure and the absence of synchronous beats in the arterial pulse might aid in the diagnosis of hypertension in the cerebrospinal fluid. Subarachnoid injection of even relatively large amounts of certain drugs modified very little and only transiently the pressure at lumbar puncture, whether any of the fluid had been withdrawn beforehand or not.

Jan. 26-29, 1921, **35**, No. 5

*Gastric Ulcer. P. Le Noir and E. Agasse-Lafont.—p. 77.
*Results of Operative Treatment of Gastric Ulcer. E. Denéchau.—p. 83.
*Early Diagnosis of Gastric Ulcer. H. Durand and Lutier.—p. 87.

Gastric Ulcer.—Simple ulcer without complications is discussed here, and the frequency of latent insufficiency of kidneys and liver with ulcer in the digestive tract.

Remote Results of Operative Treatment of Gastric Ulcer.—Denéchau reviews 28 operative cases of gastric ulcer with an interval since up to fourteen years. This supplements his previous series of 95 cases published in 1907. In the gastro-enterostomy cases the outcome was bad in 11 of 100 patients reexamined, but only 1 died eight years later from cancer, and indurated ulcer did not develop in any case. In 51 cases with interval of from four to twelve years, the outcome has been most excellent in 10. He draws the conclusion from this long study that the future is for excision; this alone wards off cancer, but the many successful cases of gastro-enterostomy alone, especially for stenosis, show that much can be anticipated with this, especially with continued surveillance and careful diet.

Early Diagnosis of Gastric Ulcer.—The main thing, Durand and Lutier remark, is to think of the possibility of gastric ulcer; it is much more frequent than generally supposed. The long array of means at our disposal show that it is possible to detect ulceration in the digestive tract.

Bulletins de la Société Médicale des Hôpitaux, Paris

Jan. 14, 1921, **45**, No. 1

*Tuberculosis in Region of Endemic Goiter. Coulaud.—p. 5.
Epidemic Hiccup Followed by Encephalitis. L. Rivet and M. Lipschitz.—p. 8.
*Prevention of By-Effects of Neo-Arsphenamin. Sicard and Paraf.—p. 11.
*Vaccine Treatment of Purulent Pleurisy. H. Dufour and Debray.—p. 16.
Experimental Vaccine Therapy. H. Dufour.—p. 19.

Tuberculosis in Region of Endemic Goiter.—Coulaud found 100 families with goiter, representing 1,000 persons examined. There were 220 cases of goiter and 230 of known tuberculosis. The families seemed to be inclined to pathologic thyroids. In some it was too active and in others not active enough. None in this latter group had developed tuberculosis; it seemed to attack those with exaggerated thyroid functioning.

To Ward Off By-Effects of Neo-Arsphenamin.—Sicard and Paraf theorize to explain the efficacy of intravenous injection of an alkali in treatment of the serious symptoms encountered with injection of neo-arsphenamin. They explain it by the recent research of Lumière and Kopaczewski which seems to demonstrate that antiflaking substances introduced into the blood will protect it against the shock sometimes observed with neo-arsphenamin. The substance they have selected for the purpose is sodium carbonate, injecting into the vein 30 c.c. of physiologic saline containing 0.60 or 0.75 gm. of sodium carbonate, following through the same needle with the solution of neo-arsphenamin. This protects against the shock as effectually as Besredka's method of preliminary injection of a small amount of the antigen. Skeptophylaxis is realized. In the discussion that followed, Milian stated that he had been using for the same purpose sodium hydroxid but he explains the action in another way. He thinks the alkali prevents the splitting up of the arsenical, which is responsible for the *crises nitritoïdes* in connection with suprarenal insufficiency. He has been advising this alkalinization since 1912, and has been able to ward off these nitritoid symptoms by adding a sodium salt to the solution of the arsenical.

Vaccination Treatment of Purulent Pleurisy.—The recovery from streptococcus purulent pleurisy under the influence of vaccine therapy alone is reported by Dufor and Debray. The patient was a girl of 15, and the disease had developed slowly and the general health kept good. They have been equally successful in some cases of typhoid spondylitis several months after typhoid fever. There is little hope of benefit, they say, from vaccine therapy in acute cases.

Jan. 21, 1921, **45**, No. 2

Painful Multiple Exostoses in Inherited Syphilis. M. Pinard.—p. 21.
*Epidemic Encephalitis. R. A. Gutmann and Kudelski.—p. 24.
*Tuberculous Stenosis of Small Intestine. C. Oddo and C. de Luna.—p. 27.
*Velocity of Pulse Wave. C. Laubry, A. Mougeot and R. Giroux.—p. 30.
*Instrumental Orthopedics. G. Bidou.—p. 35.
*Epidemic Encephalitis in Hospital. H. Claude and J. de Laulerie.—p. 36.
*Epidemic Encephalitis in Roommates. H. Roger and A. Blanchard.—p. 40.
*Common Origin of Epidemic Hiccup and Encephalitis. A. Netter.—p. 46.

Epidemic Encephalitis.—A man of 36 developed in 1916 a disease which has been retrospectively diagnosed as epidemic encephalitis. At the time it was assumed to be typhoid or malaria at first, and finally the man was sent from one service to another as amyotrophy developed. This seems to be one of the oldest cases yet known of the present epidemic of encephalitis. The acute febrile phase five years ago was followed by extreme muscular atrophy but the condition passed into a stationary phase in two years, and this stationary phase persists to date. It is said to be the first case on record of myopathy of this type after encephalitis.

Tuberculous Stenosis of the Intestine.—The multiple stenosis of the small intestine in the girl of 16 caused periodical violent pains in the region around the umbilicus, with vomiting. After four years of this, the girl died during resection of the tuberculous intestine. The strictures were of fibrous nature.

Velocity of Pulse Wave.—Laubry and his co-workers discuss the velocity in connection with the arterial tension, weakness of the heart, elasticity of the arteries, sudden changes in the caliber of the arteries, and the tonus of the vascular system in general as affecting the velocity of the pulse wave. They show that the velocity varies proportionately to the arterial blood pressure, and discuss the symptomatic importance of variations from the normal.

Instrumental Orthopedics.—Bidou has continued his experiments to utilize in prostheses the forces left in the mutilated body. Each case has to be studied by itself, but the prospects of this method are most encouraging, he says.

Epidemic Encephalitis.—Claude and Laulerie report the case of a man in the hospital since last August on account of paraplegia, who recently developed epidemic encephalitis, unmistakably a case of hospital infection. There had been five cases of epidemic encephalitis in the hospital but the last one had left in September, except that one man is still under treatment for postencephalitic shaking palsy. In the women's ward, a girl of 17 developed epidemic encephalitis a month after she had entered the hospital for treatment of epilepsy. There had been three other cases of epidemic encephalitis in the ward. These are the first cases of hospital contagion observed. Netter remarked that the cases of contagion are becoming more numerous, and the question of prophylaxis more perplexing; isolation cannot be kept up for years. Hallé reported the death of an infant with symptoms suggesting possible epidemic encephalitis ten days after its mother had presented the same, and the child died.

Contagion of Epidemic Encephalitis.—Roger and Blanchard cite a number of cases of contagion, and report the development of the disease in two recruits occupying the same dormitory with beds close together. The interval between the first symptoms in the two cases was fifteen days.

Epidemic Hiccup and Encephalitis.—Netter mentions that encephalitis has been more frequent in Paris this year, and he reports a case of encephalitis in a woman who had been having uncontrollable hiccup for four days followed by a week of malaise. In another case the encephalitis developed in a young man who had been visiting a brother with epidemic hiccup a week before. Netter has encountered a second case confirming this connection, the encephalitis developing two weeks after prolonged contact with a case of prolonged hiccup. Baur has also reported a case of a woman with lethargic encephalitis whose husband and brother-in-law had been having epidemic hiccup. Lemierre has also recently seen a case of typical epidemic encephalitis in a man of 62 after the servant of the family had been having hiccup for three days.

Encéphale, Paris

Jan. 20, 1921, **16**, No. 1

Pathologic Anatomy of Idiots. H. Hoven.—p. 1.
The Thyroid in Case of Melancholia. Parhon and Stoecker.—p. 13.
Aphasia and Psychology of Thinking. R. Mourgue.—p. 26. Cont'n.
The Humoral Syndrome of General Paresis. J. Lhermitte.—p. 33.

Paris Médical

Feb. 5, 1921, **11**, No. 6

*Radiotherapy of the Ductless Glands. A. Béclère.—p. 97.
Radiodiagnosis of Adhesion of the Pleura. F. Barjon.—p. 104.
Pneumoperitoneum for Radiodiagnosis. H. Béclère.—p. 107.
Radiodiagnosis of Calculi of the Ureter. F. Arcelin.—p. 111.
Radiodiagnosis in Dentistry. J. Pierquin and L. Blanc.—p. 116.
*Radium Treatment of Rectal Cancer. M.-H. Cesbron.—p. 121.

Radiotherapy of the Ductless Glands.—Béclère reviews the present status of radiotherapy of the various endocrine glands, adding that only the thyroid, the thymus and the pituitary can be treated in this way at present. "Used in time, and for suitable morbid conditions in these three, it is a wonderful method of treatment, the benefits of which should be more and more appreciated." He regards it as the best of all treatment for exophthalmic goiter and in general for all forms of hyperthyroidism. It acts on the function more than on the lesion, and it should be guided by the circulatory disturbance, the frequence and the instability of the heart rate. The technic should avoid all reaction on the part of the skin, and there is danger of substituting hypothyroidism for the excessive functioning. Along these lines the treatment of exophthalmic goiter is one of the finest achievements of radiotherapy. It is also the best treatment for hypertrophy of the thymus. He has been successful with it also in treatment of tumor of the pituitary, and has witnessed the complete disappearance of headache, vertigo and vomiting from intracranial hypertension. In a recent case the ophthalmoplegia and ophthalmic neuralgia subsided under it. When menstruation has been arrested, roentgen-ray treatment of the pituitary may restore normal function. He regards radiotherapy of the pituitary as imperatively indicated as long as the symptoms are progressive. When they become stationary, he suspends the treatment, ready to resume it again. The pituitary is reached by the rays at a distance of 7 or 10 cm. from the skin in the forehead and temporal region, the gland being at about the same distance from every point of this quarter of a sphere. He does not know of any one having treated hypernephroma in this way, but knows no reason why this could not be done.

Radium Treatment of Rectal Cancer.—Cesbron reviews the different technics for acting on rectal cancer at different heights. Cancer in the sigmoid segment is hard to reach and there is danger of inadequate exposures.

Presse Médicale, Paris

Feb. 2, 1921, **29**, No. 10

*Manometer Mask. J. L. Pech.—p. 93; P. Desfosses.—p. 94.
*Wound of the Heart. P. Moure and R. Soupault.—p. 95.

Manometer Mask.—Pech gives tracings showing the maximal respiratory force as determined by this mask which fits air-tight to the face but does not impede respiration. The maximal *débit respiratoire* of a normal adult should be about 1.75 liters per second. In the tuberculous, this maximal effort may drop to 0.50 per second and in pneumonia to 0.20. This manometer mask has proved very useful to supplement the data from auscultation. The details of the mask are shown in the illustrations.

Desfosses calls attention to the importance of this manometer mask in medical control of physical education and in study of the respiration. He declares that estimation of the maximal respiratory effort is as important as study of the blood pressure. Every exercise of any violence should be forbidden to those whose respiratory effort is low, and this mask is a simple means by which we can actually determine this. He analyzes the findings in 100 healthy adults and in children. As it allows the subject to see for himself what he is able to accomplish in inspiration and expiration, it is an excellent means of training in effectual nasal respiration.

Wounds of the Heart.—The advantages are extolled of cutting a flap through the sternum on the median line with extension to the left at top and bottom. By turning back this bone flap we obtain access to the heart from the second to the fifth interspace as in a case described, with a diagram.

Feb. 5, 1921, **29**, No. 11

*Tuberculous Bone and Joint Disease. E. Sorrel.—p. 101.
*Carbon Dioxid Snow in Dermatology. Vignat.—p. 102.
*Capillaroscopy. M. Weiss.—p. 103.

Tuberculous Bone and Joint Disease.—Sorrel is chief surgeon of the seashore hospital at Berck, and his experience has confirmed that the combined heliotherapy and seashore environment form the most energetic treatment at our disposal for tuberculosis of bones and glands. He does not place much value on drugs, and relates that autoinoculation with fluid from the diseased joint has been abandoned for various reasons. Serotherapy has given inconstant results, and has to be kept up a long time to be effectual. These and tuberculin are still on trial, as also high frequency currents, but roentgen-ray treatment of tuberculous glands has already given fine success in certain cases. With bone disease, although general treatment is of primordial importance, local measures must not be forgotten. They vary, however, with the age; in children the minimum of intervention should be the rule; in adults, resection. After the age of 50, a cure cannot be counted on, and amputation is generally called for. We have quite an array of measures thus at our disposal but, he says, we cannot claim to shorten very much the duration of a tuberculous

lesion. It runs an almost cyclic course. We cannot cure it in six months or a year, but at least we can guide it, reducing the destruction, and providing for healing with minimum of loss of function. In the differential diagnosis, the effusion may show the presence of lipolytic ferments and predominance of lymphocytes. Cultivation of the pus is generally regarded as giving unreliable findings.

Cryotherapy in Dermatology.—Vignat emphasizes that the carbon dioxid snow pencil is liable to be contaminated with molds and bacteria, especially streptococci. For this reason he prefers to use a refrigerating mixture in a carrier which can be sterilized. The mixture of a little acetone with the carbon dioxid snow causes a temperature of minus 80 C., and this has a very favorable action especially in erythematous lupus, seborrheic acne, nodular folliculitis, etc. He has thus obliterated large reddish nevi, leaving an almost invisible scar. This method surpasses roentgen and radium treatment. In the hospital in his charge he has the exposed area covered afterward with a salve, and this is dusted thick with a powder, both flesh colored. In one case of erythematous lupus of the nose, after the eschar had dropped off, the skin was like a new skin, without a trace of scarring. In his cases a cure was complete as a rule after three or four applications with ten or fifteen days' interval. Even when a complete cure was not possible, transient improvement was always realized, and particularly with nevi and erythematous lupus. For nevi he always prefers the cryotherapy, but with large angiomas, superheated air is more certain and prompter in the response induced. The illustrations of one child show the complete subsidence of a large angioma of the brow and orbit under treatment with a jet of superheated air, but cryotherapy has the advantage over this that it is painless.

Capillaroscopy.—M. Weiss analyzes recent works on the capillary circulation and its significance. As the respiratory movements, by the vacuum which they induce in the lungs, attract the capillary blood into the right auricle, they accelerate the circulation in the veins throughout. E. Weiss does not hesitate to say that nephritis from chill and scarlatinal nephritis seem to be manifestations of a general disease of the capillary apparatus. He even defines scarlet fever as a generalized capillaritis. It affects the skin and the kidneys. Heart disease modifies even the capillary circulation. With congenital cyanosis and complicating bone and joint disease, the venous portion of the capillary loops is engorged. This suggests that disturbance in the peripheral circulation may have something to do with the pathogenesis of joint disease.

Feb. 9, 1921, **29**, No. 12

*Injury of Semilunar Cartilage. J. Terracol and L.-J. Colanéri.—p. 113.
*Alimentary Disease of Bone. A. Chelmonski.—p. 115.
Injury of Lung from Local Serotherapy. H. Sloboziano.—p. 116.

Semilunar Cartilages After Trauma.—Terracol and Colanéri injected air directly into the knee joint on suspicion of injury of a semilunar cartilage, and give illustrations showing the characteristic radioscopic findings with separation of the internal or external meniscus. There is a white line that looks as if made with a finger nail, cutting the meniscus. The discovery of this verifies the clinical findings and establishes the diagnosis and treatment.

Alimentary Disease of the Bone.—Chelmonski writes from Warsaw to describe a number of cases of what he calls alimentary osteoporosis encountered during the German occupation, when famine reigned. There were two forms, one with pains and a flexible and fragile state of the bones; the other resembles more osteomalacia, although not connected with pregnancy, and the general health keeps good, and there is no deformity of the pelvis. Recovery is prompt when the patients can have repose and proper food.

Progrès Médical, Paris

Jan. 15, 1921, **36**, No. 3

Epidemic Hiccup. P. Blum.—p. 23.
*Diseases Causing Precipitation. M. Loeper.—p. 26.
*Marriage of Syphilitics. L. Bory.—p. 29.
Senile Psychosis of Recrimination. J. Mire.—p. 31.
The Hospitals of the Middle Ages. Coudeyras.—p. 32.

Diseases Causing Precipitation.—Loeper refers to precipitation of uric and oxalic acid, of derivatives of calcium, and cholesterin, and emphasizes the necessity for differentiating between them.

Marriage of Syphilitics.—Bory discusses the conclusions of the report of the committee appointed by the Société française de dermatologie et de syphiligraphie, which was mentioned in THE JOURNAL on page 552. He declares that the committee put the cart before the horse, as they do not emphasize the necessity for a uniform standard of treatment and a uniform standard of technic for the serologic tests.

Revue de Chirurgie, Paris

1920, **39**, No. 9-10

*Traumatic Injury of Semilunar Cartilage of Knee. O. Jacobs and G. Worms.—p. 529.
*Ether Anesthesia by Way of Rectum. A. Chalier and C. Dunet.—p. 584.

Trauma of Semilunar Cartilage of the Knee.—Jacob and Worms declare that all that is needed for recent injury of a meniscus is reduction, immobilization and compression to promote consolidation of fracture, and then retraining the muscles and joint to proper functioning. Massage to prevent atrophy of muscles should be supplemented by the patient's contracting the muscles in his thigh and leg several times a day, keeping this up as long as possible; even after he is using his leg, if the tendency to atrophy persists. If the meniscus has been crushed, or otherwise reduction is impossible, conservative measures are futile, and the meniscus should be either excised or sutured in place. They give an illustrated description of the preferable technic, and the details of ten cases all cured by resection of the meniscus. The results of about 200 cases analyzed show that "meniscectomy" is an excellent operation, not interfering with walking or balance, and rendering recurrence practically impossible. In one of their own cases partial resection of the cartilage had to be followed by total resection before the cure was complete.

Ether by the Rectum.—Chalier and Dunet analyze a total of 2,855 cases in which general anesthesia was induced by injection of ether in oil by the rectum. These figures include 1,500 reported from Russia and 1,000 compiled from American literature, with 253 in France, in addition to 102 from their own practice. In this total there were six fatalities for which the method itself seemed to be responsible. Consequently, notwithstanding its undoubted advantages in many cases, they warn against it as too dangerous except for young persons, free from pathologic taint, with their emunctories functioning well. It should be preceded by loading the liver with glycogen to promote its various functions and resistance to toxic action. This can be accomplished, as Chevrier advises, by giving the patient the night before and the morning of the operation 150 gm. of sugar syrup, supplemented by ingestion of extract of liver and administration of glucose solution by rectal drip.

Revue Médicale de la Suisse Romande, Geneva

January, 1921, **41**, No. 1

*Acropathology. M. Roch.—p. 3.
*Vaccine Treatment of Deforming Rheumatism. De Senarclens.—p. 24.
*Phosgen Poisoning. B. Wiki.—p. 38.
*Typhoid in Infants. P. Bourdillon.—p. 49.

Acropathology.—Roch reviews the pathologic conditions connected with enlargement or disease of the hands or feet, but draws the conclusion that they are all merely a localization of a general derangement. The predominant manifestations settle in the extremities. Whether it is a question of bacterial intoxication, of spasm of the arteries, cyanosis, polyneuritis or uricacidemia, the acropathology should never be treated alone. General treatment, antitoxic, organotherapy or treatment for the nervous or circulatory system, is always indicated in addition.

Vaccine Treatment of Deforming Rheumatism.—Senarclens refers to polyarticular rheumatism of infectious origin, and expatiates on the advantages of vaccine treatment. This is effectual when the streptococcus is involved. Some writers assert that the bacteria involved in the suppuration can be found in the urine. In a case reported in a woman of 49 the vaccine therapy was successful beyond all anticipation. He cites in conclusion Crowe's recent report on 143 cases of rheumatoid arthritis; 70 per cent. can be considered cured, but 21 per cent. were not benefited by the treatment. He found the bacteria in the urine only in 31.59 per cent.

Phosgen Poisoning.—Wiki discusses phosgen poisoning in war and in certain industries, but adds that physicians must not forget that this gas may be generated during the administration of chloroform in a room lighted with gas. He describes an experience of the kind in Mayor's practice. Irritation in the larynx with a pricking in the throat, spasmodic cough and disagreeable odor in the room warned of danger.

Typhoid in Infants.—In Bourdillon's case three infants in three different families developed typhoid at an interval of three and four years. The only link between them was the nurse who had cared for them in turn, but she refused examination to ascertain whether the assumption that she was a typhoid carrier was correct.

Schweizerische medizinische Wochenschrift, Basel

Jan. 27, 1921, **51**, No. 4

The Mechanism of Respiration. F. Rohrer.—p. 73.
*Treatment of Fracture of the Tibia. P. F. Nigst.—p. 79.
*Diagnosis in Psychiatry. S. Galant.—p. 87.

Treatment of Fracture of the Tibia.—Nigst reports with illustrations the fine results obtained in sixteen cases of oblique fracture by driving in a long nail, slanting, to hold the fractured stumps together until healing was complete. All ages were included, from 10 to 67, and the nail was driven in two days after the accident or later, up to twenty-nine days, and in two cases after an interval of four months. The nail was removed in from five to twenty-three days, the fourteenth day on the average. In one case it slipped out spontaneously the third day, but the parts held their position. The results have been perfect in the eleven cases reexamined from three to six years afterward except in five cases in which the limb was shorter by from 1 to 3 cm. The shortening of 3 cm. was in a man of 61 with comminuted fracture of both bones in the leg. There was no muscular atrophy in any of the cases, and all had full earning capacity restored. He commends, therefore, this oblique nail treatment according to Arnd, as superior to all others for oblique and twisted fractures of the leg with lengthwise displacement of the fragments, impossible to reduce and retain otherwise without an operation.

Diagnosis in Psychiatry.—Galant adds "and Mistakes in Diagnosis" to his title, and reiterates that diagnosis is an art, almost *the* art in medicine and it cannot be learned out of a book. "The practice of medicine is a true art, rooted in insight, with diagnosis as its highest achievement." He says that psychiatrists are too often content with a partial diagnosis.

Policlinico, Rome

Jan. 31, 1921, **28**, No. 5

*Arsenical Treatment of Organic Contracture. P. Magnadda.—p. 147.
*Complications of Vaccination Against Smallpox. A. Sala.—p. 151.
*Posterior Gastro-Enterostomy. A. Cernezzi.—p. 152.
*Treatment of Retrodeviation of the Uterus. M. Ciulla.—p. 154.
Wound of the Heart. G. Candido.—p. 155.

Arsenical Treatment of Organic Contracture.—Five cases are described which confirm the moderate benefit liable to be derived from arsenical treatment for irreducible contracture of long standing, but the results were transient, and proved disappointing.

Complications of Vaccination Against Smallpox.—Sala reports a streptococcus phlegmon in the vicinity of the kidney after vaccination of one woman, and a staphylococcus abscess in the kidney after vaccination of a boy of 15.

Posterior Gastro-Enterostomy.—Cernezzi regards Duval's method of access to the posterior wall of the stomach as a great improvement in the technic for posterior transmesocolic gastro-enterostomy. He opens into the cavity back of the omentum, along the upper margin of the transverse colon, making the anastomosis with the first loop of the small intestine drawn up through a slit in the transverse mesocolon. This gives ample oversight of the posterior wall without traction on it.

Treatment of Retrodeviation of the Uterus.—Ciulla has been impressed with the advantages of the Parlavecchio technic for correction of retrodeviation and prolapse of the uterus. He cuts a vertical flap of fascia, 2.5 cm. wide and 6 cm. long, formed of the linea alba and adjacent portions of the sheaths of the rectus muscles. This rectangular flap with base at the pubis is pushed down into the space between the bladder and the uterus, after the latter has been drawn high up. The flap is then sutured to the posterior wall of the bladder and to the anterior wall of the uterus, and thus obliterates completely the space between them. The lower two thirds of the uterus are thus solidly fastened while the rest is left free, and there is no interference with gestation later.

Riforma Medica, Naples

Jan. 15, 1921, **37**, No. 3

*Angle Between Heart and Liver. A. Cantani.—p. 50.
*Diagnosis of Scarlet Fever. G. Tron.—p. 55.
*Prolapse of Colon Through the Anus. R. Cassanello.—p. 57.
Differentiation of Hysteric Convulsions. A. Ferrannini.—p. 59.
Spirochetoses. I. Jacono.—p. 60.

The Angle Between the Heart and the Liver.—Cantani explains in detail the diagnostic import of the shape of the angle between the heart and the liver, especially with valvular disease.

Induced Local Blanching in Diagnosis of Scarlet Fever.—Tron has been examining fifty children at different stages of scarlet fever with ninety-nine control tests, applying the test described by Schulz and Charlton in 1917, and called the "extinction test." He found it occasionally positive but not often enough to confer diagnostic value on it. The technic was described in THE JOURNAL, Aug. 14, 1920, p. 512.

Prolapse of Colon Through the Anus.—In Cassanello's case the prolapse was caused by invagination owing to traction from a pedunculated lipoma.

Brazil-Medico, Rio de Janeiro

Jan. 8, 1921, **35**, No. 2

*Spheno-Orbital Meningocele in Child. F. Luz.—p. 17.

Spheno-Orbital Meningocele.—The small congenital tumor had developed by the age of 2 to be nearly as large as the child's head, dragging half of the mouth down with it, when fully distended. The child seemed otherwise normal, but did not survive the removal of the tumor by ligation of the pedicle at its emerging point from the sphenoidal fissure. The child died next day with symptoms of meningitis. Luz compares with this the cases of facial encephalocele or meningocele on record. The mortality ranged from 20 to 31 per cent. In Kondring's case the child survived the operation but died in convulsions three months later. This case resembled Luz' more than any others in the literature.

Gaceta Médica de Caracas, Venezuela

Dec. 31, 1920, **27**, No. 24

*Oriental Sore on the Hand. R. Pino Pou.—p. 303.
Parenteral Injections of Milk. Ochoa.—p. 303.

Oriental Sore on the Hand.—Pino Pou reports a case in which the nature of the lesion on the hand had not been suspected, and treatment had been applied for syphilis, with merely aggravation. The microscope revealed the leishman bodies, and tartrate of antimony and potassium by the vein cured it promptly.

Revista Médica de Chile, Santiago

November-December, 1920, **48**, No. 11-12

Present Status of Gynecology. G. Anwandter.—p. 671.
Silver Salvarsan. M. Brockmann.—p. 675.
*Serums and Vaccines in Specific Immunity. Mamerto Cádiz.—p. 682.
*Preparation for Operations on the Stomach. H. Garcia Huidobro.—p. 709.
Epidemic Encephalitis. E. Prado Tagle.—p. 714.
*A Protozoon in Relation to Typhus. D. Montfallet.—p. 718.
The Internal Secretions. J. Rodriguez.—p. 732.

Serums and Vaccines in Specific Immunity.—This is a lecture in a graduate course on the biologic therapeutic preparations.

Preparation for Operations on the Stomach.—Garcia Huidobro warns that only about one person in ten who applies for relief from stomach disturbances has an actual organic lesion. Tuberculous and syphilitic disease of the stomach is very rare. In about a third, the symptoms are due to hygienic errors and in another third the stomach symptoms are secondary to some abdominal disease. Intestinal kinks are fre-

quent and cause dilatation of the duodenum and spasm of the pylorus, which simulate stomach disease. It must not be forgotten also that latent tuberculosis, tabes, and insufficiency of the liver, kidneys or heart may also give rise to dyspeptic disturbances. After the operation, the vomiting and intolerance can be combated with rinsing out the stomach with hot artificial serum, and the spasms with atropin.

Protozoon in Relation to Typhus.—Montfallet relates experiences which have convinced him that the virus of typhus is of the herpetomonas genus, without flagella, and intracellular. He regards the herpetomonas as piroplasmas in a farther advanced stage of evolution. It probably is akin to *Herpetomonas equinus*. These conclusions are the result of years of research and experiments.

Semana Médica, Buenos Aires

Sept. 2, 1920, **27**, No. 36

*Serodiagnosis of Hydatid Cyst. I. L. Imaz Apphatie and E. Lorentz.—p. 303.
*Protein Shock Treatment of Tuberculosis. J. Divito.—p. 315.
Gastrectomy for Cancer of Stomach. G. Palacios.—p. 317.
*True and Spurious Stomach Disease. S. M. Zayas.—p. 319.

The Fixation of Complement in Diagnosis of Hydatid Cyst.—Imaz Apphatie and Lorentz cite their publications to show that they were the first to apply the serodiagnosis of echinococcus disease, their publications dating from Oct. 10, 1908, and preceding those of Weinberg and his colleagues. Ghedini before them had found antibodies in the hydatid cyst, but always postoperative, and he had never applied the test in diagnosis.

Treatment of Hemoptysis.—Divito injected normal horse serum to arrest hemoptysis in a number of tuberculous patients, and found that marked improvement followed an anaphylactic shock. He has given this treatment to sixty patients during the last ten years, and regards the effect as very encouraging. He thinks that tuberculin treatment and also artificial pneumothorax owe their efficacy to the reactions which they induce in the blood serum. He asserts further that anaphylaxis is not so formidable in the tuberculous as under other conditions, perhaps.

True and False Stomach Disease.—Zayas classifies the various types of stomach disease, and sets in a group apart the cases in which there are symptoms from the stomach owing to loss of balance in the abdomen, or to disease of the nervous system or liver, or to syphilis or anemia.

Archiv für Kinderheilkunde, Stuttgart

Feb. 1, 1921, **68**, No. 6

*Infantile Pseudobulbar Paralysis. M. Fiebig.—p. 425.
*Ossification of the Bones in the Hand. E. Stettner.—p. 439.

Infantile Pseudobulbar Paralysis.—Fiebig encountered infantile pseudobulbar paralysis in 2.83 per cent. of 600 applicants for treatment at the dyspensary for voice and speech disturbances at the Berlin Charité during the last two years. Three of the seventeen cases were adults between 24 and 26. One of these young men found it so difficult to speak that he wrote what he had to say. He could pronounce the letter "p" only by pressing the lips together with his hands. The difficulty in speaking had been ascribed to deformity of the lower jaw, and an operation had been done on this assumption. Several typical cases are described in detail, and Fiebig warns that in all such cases of which he knows the mind was not affected, although the patients produced the impression of imbecility on account of the open mouth and the dribbling of saliva. The nasal tone is due to paralysis of the soft palate, and this has to be stimulated by exercises in speech. The prognosis is generally good, as children usually learn to overcome the effects. As the focus is in the cortex, not the oblongata, there is no atrophy or degeneration of muscles. The dysarthria is the main symptom. The affection occurs probably oftener than supposed, but escapes detection as the child is classed with the feebleminded. An aviator was left with injury of the meninges, after a fall, and disturbances in speech resembling those with infantile pseudobulbar paralysis, which throws light on the nature of infantile pseudobulbar paralysis. Fiebig reiterates in conclusion the importance of testing the child's mentality. Other things being equal, the child will progress better in studies and speech with children of his own mental grade than if classed with backward children. The physician should watch over his school life to prevent his being teased and ridiculed by the healthy children.

Ossification of the Bones in the Hand.—Stettner discusses the relations between the ossification of the hand and the age and height of healthy and sick children, from birth to puberty.

Archiv für klinische Chirurgie, Berlin

Aug. 3, 1920, **114**, No. 1

Origin of Loose Bodies in Joints. G. Axhausen.—p. 1.
*Foreign Bodies in Esophagus. F. Schlemmer.—p. 37. Conc'n in No. 2, p. 269.
Zigzag Incision with Suppurative Appendicitis. S. Jatrou.—p. 84.
Supravesical Transrectal External Hernia. V. Hantsch.—p. 91.
*Periproctitis and Fistula Ani. L. Moszkowicz.—p. 107.
Advantages of Billroth I Resection of Stomach. Haberer.—p. 127.
*Chronic Duodenal Ulcer. T. Rovsing.—p. 172.
*Resection of Thymus in Exophthalmic Goiter. B. O. Pribram.—p. 202.
Reconstruction of Lower Part of Face. A. W. Meyer.—p. 215.
Myomas of Intestines. H. Linsmayer.—p. 235.
Tumor of Omentum. J. Richter.—p. 248.
*Mechanism of Regeneration of Tendons. E. Rehn.—p. 253.

Foreign Bodies in the Esophagus.—Schlemmer succeeded in extracting the foreign body with the aid of esophagoscopy in 96.03 per cent. of his 529 cases. He found roentgenoscopy of great assistance in some cases, but negative findings proved unreliable. If no blind attempts to mobilize the foreign body have been made, a delay of two or three days after the swallowing of the foreign body does no harm as a rule, he says, and this gives time for the patient to go to some center fully equipped for extraction of foreign bodies. If urgent intervention is required, he advises esophagotomy without preliminary catheterization. Only exceptionally is general anesthesia required for adults, but always for children. Under bed rest, ice bag to the neck, ice pills, and a tablet of some disinfectant in the mouth, healing is prompt and complete in the majority, even in the elderly. In one of his cases a needle was impacted just below the vocal cords, piercing both esophagus and larynx walls, and there was fever. For fear of further injury, the needle was removed by esophagotomy although it was plainly visible. His whole series is analyzed.

Periproctitis and Fistula Ani.—Moszkowicz emphasizes the deplorable conditions frequently entailed by operations in this region. The principle he advocates is to clear out and open up the focus, transforming it into an open shallow cavity, and line it with skin. The sphincter must be left absolutely unmolested so far as possible. In ninety-five cases recently reexamined in which the sphincter had been severed before the year 1909, persisting incontinence was found in seventeen. He found that when the external sphincter is functioning normally, the internal seems to function by reflex action. But when the external has been severed, the normal internal sphincter seems to lose with it the power of proper functioning.

Chronic Duodenal Ulcer.—Rovsing's experience with 164 operative cases has confirmed, he remarks, the superior advantages of excision of the ulcer with a plastic operation on the pylorus by Mikulicz' method. He describes this procedure as applied in ten cases of perforated ulcer.

Resection of the Thymus in Exophthalmic Goiter.—Pribram reports a case in which the thyroid was not much enlarged although the other symptoms of exophthalmic goiter were pronounced in the woman of 26. Part of the persisting thymus was resected along with part of the right and left lobe of the thyroid. Striking improvement followed, the heart action becoming regular. Others have reported similar benefit from thymectomy in arrhythmia. It actually seems, Pribram remarks, that thymectomy is liable to modify certain properties which we are accustomed to regard as constitutional. This assumption is confirmed by the favorable result of thymectomy in a youth of 17 of eunuchoid type with pronounced status thymicus. The blood showed the lymphatic reaction and a brother had died from acute leukemia. Three months after the thymectomy, the epiphyseal cartilages had nearly completely consolidated, while the relative lymphocytosis had dropped to normal. The hyperplastic thymus has evidently an influence in determining what we call the constitution, and experience is proving that the "constitution" is by no means a preordained, immutable condition. It depends

on the functioning of the ductless glands, and this may vary spontaneously or be induced to vary. Steinach's experiments with implanted gonads confirm this.

Gaps in Tendons.—Rehn discusses the mechanism of regeneration of a tendon and means to promote it.

Archiv für Verdauungs-Krankheiten, Berlin

1921, **27**, No. 2

*Opium and Secretion in the Stomach. L. Jarno.—p. 91.
X-Ray Visualization of Cardiospasm by Means of Delineator. M. Einhorn and T. Scholz (New York).—p. 97.
Retrograde Stretching in Treatment of Impermeable Cardiospasm. M. Einhorn (New York).—p. 111.
*Occult Blood in Stools. J. Koopman.—p. 122.
*The Abdominal Triad. W. Zweig.—p. 128.

Opium Test of Secretion in the Stomach.—Jarno expatiates on the necessity for discriminating between partial and total loss of gastric secretion, as this is important for the prognosis. When there seems to be achlorhydria, he has found that opium given before the test meal promotes secretion of gastric juice, and thus distinguishes between the cases in which the secretion is entirely lost and those in which it still can be induced. He gives by the mouth 0.04 gm. extract of opium two or three hours before the test breakfast. By this means he found normal or almost normal acidity in previously severely hypo-acid stomachs. He found free hydrochloric acid even in one case of achlorhydria. The details of ten cases are given. This method reveals the maximal secreting power of the stomach.

Occult Blood in Stools.—Koopman has been experimenting with the various tests for occult blood in stools, and tabulates the findings with a given amount of normal stools to which a given amount of blood had been added, from 0.1 to 10 per cent. He found the Snapper method the most reliable of the spectroscopic tests, but it was far surpassed by Boas' chloral-alcohol modification of the Weber test. But even this was surpassed by the accuracy of the Schlesinger-Holst benzidin test. He does not give the technic for any of these tests.

The Abdominal Triad.—Zweig relates that increasing experience has confirmed his belief in the frequent coexistence of duodenal ulcer, cholecystitis and appendicitis. He shows this by thirteen typical examples, confirmed by operation, and mentions nine others in which one of the triad was overlooked at the operation and was finally cured by medical means alone. He assumes a common cause for all three, an infection spreading from the intestines, involving the appendix or the gallbladder, or both together. There is much to sustain the assumption that a duodenal ulcer is the result of retrograde embolus. He warns that in operating for either one of the triad, the others should be excluded before concluding the operation. The appendix should always be removed as a routine measure with any of the three.

Deutsches Archiv für klinische Medizin, Leipzig

Oct. 26, 1920, **134**, No. 1-2

Obliteration of the Pleura. H. Deist.—p. 1. Cont'd.
*Colloidal Reactions in the Cerebrospinal Fluid. M. R. Bonsmann.—p. 20.
*Palpation of Right Ventricle Through Epigastrium. F. A. Harzer.—p. 37.
*The Intermediate Carbohydrate Metabolism. W. Stepp and H. Lange.—p. 47.
*Alkaptone and Acetone. G. Katsch.—p. 59.
*Chlorids in the Urine in Influenza. H. Eisleb.—p. 69.
Physiology as Basis for Dietetics. F. Rabe.—p. 92. Cont'd.
*Intermediate Carbohydrate Metabolism. II. W. Stepp and H. Zumbusch.—p. 112.
*Elimination of Phosphoric Acid in Kidney Disease. A. Dorner.—p. 119.

Colloidal Reactions in the Cerebrospinal Fluid.—Bonsmann lists the findings in 230 cases with both the colloidal gold and the mastic tests applied repeatedly. Multiple sclerosis and brain tumors are liable to give misleading findings, but a negative colloidal gold reaction can be relied on as positively excluding syphilis, he declares.

Palpation of Right Ventricle Through the Epigastrium.—Harzer palpates the heart, during deep inspiration, in the left epigastric fossa between the xiphoid process and the left costal arch, the patient lying on his right side. When the right ventricle is dilated and hypertrophied, the palpation findings are much more distinct than by other methods. The systolic murmur of tricuspid insufficiency can be ausculted best in this way.

The Intermediate Carbohydrate Metabolism.—Stepp and Lange write from Voit's service to describe the finding of volatile substances in the urine of a number of diabetics, these substances reducing Fehling's solution. They seem to be of an aldehyd nature. The tests applied showed it to be acetaldehyd. It occurred always associated with acetone and acetic acid in the urine.

Alkaptone and Acetone.—Katsch tabulates the metabolic findings and those of various tests in a case of alkaptonuria in a boy who has been under observation and the subject of research for several years. The findings confirm that the alkaptonuria subsides during the acidosis induced by withdrawal of carbohydrates. It subsides as ketonuria appears. When the acidosis supplants the alkaptonuria, the amount of acetone bodies eliminated is larger than can be explained by the transformation of the aromatic albumin complexes.

Chlorids in the Urine in Influenza.—Eisleb reports that the elimination of sodium chlorid in the urine in influenza is like that in croupous pneumonia, which may aid in the differential diagnosis.

Intermediate Carbohydrate Metabolism.—Stepp and Zumbusch discuss here the quantitative behavior of formic acid in normal and pathologic blood.

Elimination of Phosphoric Acid in Kidney Disease.—Dorner was unable to find any connection between the elimination of P_2O_5 and the clinical condition, as he shows in ten cases of various diseases.

Münchener medizinische Wochenschrift, Munich

Nov. 19, 1920, **67**, No. 47

Daily Variation in Mortality. F. Oppenheim and L. Ritter.—p. 1339.
Daily Variations in Child Mortality. M. Cramer.—p. 1341.
Chronic Recurrent Stomach Ulcer. F. König.—p. 1341.
*Pepsin Fomentations for Cicatricial Keloids. W. Frieboes.—p. 1343.
Treatment of Hereditary Disease and Inferiority. Siemens.—p. 1344.
Nonspecific Immunization in Diseases with Unknown Curative Agent. E. F. Müller.—p. 1349.
*Hemorrhagic Abortion and Evacuation of Uterus. H. Neu.—p. 1350.
*Pertussis and Influenza. F. Reiche.—p. 1352.
Sachs-Georgi Test—Micromethod—in Syphilis. K. Scheer.—p. 1352.
Fluorescence in Ultramicroscope of Spirochetes with Vital Stain. F. W. Oelze.—p. 1354.
Trichlorethylene in Histologic Work. E. Bruch.—p. 1354.
Avoidance of Roentgen-Ray Injuries by Establishment of a Uniform Dosage. H. Dietlen.—p. 1355.
Hereditary Harelip. H. Tichy.—p. 1356.
Entoptic Phenomenon During Systole. B. Solger.—p. 1356.
Esophylaxis of the Skin and Infectious Diseases. B. Lipschütz.—p.1356.
Injection of Sodium Chlorid Solution into Placenta. Frankl.—p. 1357.

Effect of Pepsin Fomentations on Cicatricial Keloids.—Frieboes reports from the Rostock dermatologic clinic his experiences with the pepsin method of treating keloids. He experimented with from 1 to 3 per cent. pepsin solutions, both hot and cold, and with and without hydrochloric acid. The results, after treatment extending over weeks and months, were excellent. He found there is no advantage in solutions stronger than 1 per cent.; also that it does not matter whether the solution is hot or cold, and that the addition of hydrochloric acid has no particular value. Frieboes recommends this prescription: pepsin, 1 gm.; boric acid, 3 gm.; water enough for 100 gm. Application was made usually only at night, but occasionally both day and night. Cicatricial keloids as thick as the little finger, resulting from severe burns, disappeared completely after three months' treatment, so that only a soft, scarcely noticeable atrophic scar remained. He has found the pepsin treatment valuable also in treating patients with keloid from lupus.

Hemorrhagic Abortion and Immediate Evacuation of the Uterus.—Neu states that at the Frankfort University Woman's Hospital, when a case of hemorrhagic abortion is admitted, the uterine secretion is examined at once, and if streptococci are found, the uterus is not evacuated but a conservative form of treatment is pursued. He does not think that the danger of a fatal hemorrhage at an abortion is sufficiently great to constitute a contraindication in the presence of a streptococcus infection.

Pertussis and Influenza.—Ruche found that influenza complicating pertussis in children gave a very serious prognosis. There were six deaths in nine cases of this double infection.

Wiener klinische Wochenschrift, Vienna

Oct. 28, 1920, **33**, No. 44

*Connection Between Fever and Dentition. H. Abels.—p. 959.
Multiple Sclerosis of Ductless Glands, Simulating Addison's Disease. J. Donath and H. Lampl.—p. 962.
Variants of Gärtner's B. Enteritidis. T. Gruschka.—p. 964.
*Defense of the Nem System. E. Nobel.—p. 965.
Meinicke and Sachs-Georgi Reactions in Internal Medicine. K. Hajós and B. Molnár.—p. 966.

Connection Between Pyretic Conditions and Dentition.—Abels reports the results of a series of observations undertaken to throw more light on the problem of so-called diseases of dentition. His observations were made on nineteen cases of measles in young children from 11 to 27 months of age. He found that during the presence of the fever and immediately afterward, many more teeth erupted than during later periods; for example, during the first four weeks there were twenty-one, in the next two weeks only five, and during the following four weeks only 4. While it has been known for years that fevers accelerate dentition, Abels thinks that this has not been sufficiently emphasized, and that physicians would do well to make it plain to mothers that teething does not cause fevers and digestive disturbance, but that, on the other hand, dentition may become more rapid after fevers.

The Nem System.—Pirquet's system of nutrition was described in THE JOURNAL, July 31, 1920, p. 332.

Zentralblatt für Gynäkologie, Leipzig

Nov. 6, 1920, **44**, No. 45

Pregnancy Kidney Disease. T. v. Jaschke.—p. 1274.
Pathogenesis of Tubal Pregnancy. F. Lehmann.—p. 1277.
Mechanical Obstruction as Cause of Tubal Pregnancy. W. Lahm.—p. 1280.
Congenital Gynatresia Hymenalis. O. Henrich.—p. 1283.
*Stimulative Roentgen-Ray Doses in Gynecology. M. Fraenkel.—p. 1285.

Stimulative Roentgen-Ray Doses in Gynecologic Practice.—Fraenkel takes the view that with the continual increase of the roentgen-ray dosage, which goes hand in hand with the continual increase of the hardness of the rays, whereby the harder the rays, the more direct the penetration of the tissues and therefore the less the effect, which fact necessitates an increase of the dosage in order to secure an increase of the effect, roentgen-ray application has entered a blind alley which makes it impossible to use roentgen rays other than for the destruction of tissues, whereas the ideal roentgenotherapy lies by no means in the destruction of the tissues but rather in their stimulation. Fraenkel endorses the opinion of Opitz (Freiburg) who recommends for carcinoma only moderate and slow irradiation, at longer intervals, in order to stimulate the adjacent healthy tissues and to avoid the cachexia which results from too rapid resorption of decomposition products. Fraenkel has found that not only in carcinoma but also in anemic myoma patients, cachexia is likely to occur, which fact he thinks has not been sufficiently emphasized. The principal stress has been placed on the application of the heaviest possible dosage, whereby stoppage of the hemorrhage was accomplished with one blow, as it were, and complete amenorrhea set in, which was looked upon with favor. Fraenkel thinks just the reverse of this is the right view to take. He says that a better effect can be secured by the application of moderate doses extending over a longer period of time, by which not only the sudden amenorrhea with all its bad effects on the mind is avoided but also the intestinal injuries, which, while not so apparent, constitute a great danger for the patient if other complications such as typhoid fever or dysentery should arise.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

Jan. 1, 1921, **1**, No. 1

*Hard Gastric and Duodenal Ulcer. A. Schalij.—p. 10.
Metastasis of Gastric Cancer. S. A. van der Perk.—p. 21.
*Intravenous Injection of Tartar Emetic. C. E. Benjamins.—p. 25.
*Peristalsis of the Kidney Pelvis. W. F. Wassink.—p. 29.
Premature Separation of the Normal Placenta. H. van der Tak.—p. 32.
Relation Between Diet and Scurvy. B. Sjollema.—p. 34.
History of Medicine. G. van Rijnberk.—p. 51.
*Leprosariums. J. G. de Lint.—p. 53.
Folk-Lore of Pilgrimages for Persons with Eye Disease in Belgium. Van Schevensteen.—p. 62.
*Poisonous Plants as Household Medicines and Charms. M. A. Van Andel.—p. 68.
*Medical Prints. G. van Rijnberk.—p. 82.

Hard Gastric and Duodenal Ulcer.—Schalij reports 47 cases, including 32 in men, nearly all of the working classes. The symptoms had been observed for from one to twenty years in 34 and from twenty to forty years in 13. In 13 cases the acidity was normal; in 3 cases there was superacidity and in 8 cases there was no free hydrochloric acid. There was vomiting of blood in about 40 per cent. and melena alone in 3 of the cases, and in 10 of those with hematemesis. He was impressed by the frequency of pain in the back in many of the cases, but in one case with gastric ulcer there was very little pain although the ulceration had caused adhesion to the pancreas. In another case hematemesis, anacidity, retention with normal pylorus, and coffee grounds vomit suggested cancer, but complete recovery followed resection of the small deep ulcer on the lesser curvature.

Intravenous Injection of Tartar Emetic.—Benjamins reviews the different infections in which tartrate of antimony and potassium by the vein has proved effectual. It has been used to advantage even in chronic malaria.

Peristalsis of the Kidney Pelvis.—Wassink illustrates a case in which peristalsis of the kidney pelvis was pronounced.

Leprosariums.—De Lint gives the history of measures for isolation of lepers from the earliest days in Europe. One leprosarium was founded by the bishop of Tours (538-593), and some in Italy date from the seventh century. Holland has several dating from an early day, and several pictures of them are reproduced. One portrays the application of a youth brought for admittance to the leper home; the picture shows that his disease was probably only favus. One print reproduced depicts with minute detail the annual procession of lepers throughout the city, Amsterdam.

Poisonous Plants as Household Medicines and Charms.—Van Andel refers in particular to hyoscyamus, datura and belladonna, solanum dulcamura, and the mandrake. His historical review shows that the solanaceae were probably responsible for the accusations of witchcraft. The hallucinations resembled those from poisoning with these drugs.

Medical Prints.—Fourteen prints dating from the fifteenth to the seventeenth century are reproduced, all portraying medical subjects, six of them operations on the foot, others on the arm.

Acta Medica Scandinavica, Stockholm

Jan. 14, 1921, **53**, No. 6

*Proceedings at the Ninth Northern Congress for Internal Medicine.

Proceedings at the Ninth Northern Congress on Internal Medicine.—This bulky number of 272 pages contains extensive summaries of forty-three articles presented at this congress held at Copenhagen in 1919. All but three of the long summaries are in English. We give abstracts of some of them.

Diet in Treatment of Chronic Heart Insufficiency (p. 606).—V. Rubow affirms the usefulness of the Karell treatment, with absolute rest. When this fails, good results may be obtained by a further reduction of the food calories and the water and salt content of the food. A reduction by dietetic means of the water content of the blood results in a corresponding fall of the dropsy. Hence, in an ordinary case, the use of digitalis, rest and Karell, or any other dry diet, for a few days each week or month, are indicated. This can be kept up for years.

Diet in Treatment of Renal Insufficiency.—K. Motzfeldt points out (p. 611) that a strict dry diet must not be used in the presence of symptoms of uremia. The reduction of salt in the food must depend on the tolerance for chlorids. The diet otherwise must depend on the tolerance for proteins, which is determined by blood analysis. If a reduction of protein is indicated, the intake must be at least 50 gm. per day. Everything considered, the diet in renal insufficiency should be individualized and made dependent on functional tests for chlorid and protein metabolism, and then be calculated as carefully as in diabetes.

Functional Kidney Tests in Prostatic Hypertrophy (p. 620).—J. Tillgren tabulates forty-two cases treated by operation, and advocates the use of the water test which often assists in the prognosis by proving cardiac failure with uremia and

azotemia present. In some hospitals this test has been used as a prognosticum before operation.

The Accommodation Test for Renal Functions (p. 631).—V. Scheel applied to a number of cases the following test: 1 liter tea, fasting, then dry diet the rest of the day, during which the variability of the urine was measured, especially the diuresis and the specific gravity. This method will show the individual variations upon which treatment must be based.

The Parathyroid Bodies and Bright's Disease (p. 644).—H. Bergstrand calls attention to a possible connection between parathyroid hyperplasia and nephritis, evident in ten cases, but was unable to demonstrate it.

Capillary Blood Pressure (p. 651).—E. Kylin describes an apparatus for measuring capillary pressure in a finger. It is easily attached to a microscope and consists of a chamber connected with a water manometer and air pump. In benign nephrosclerosis the pressure was found normal (not over 190 mm. water). In glomerulonephritis (100 cases) in acute stage the pressure rose to 750 mm., corresponding to 55 mm. mercury. As recovery proceeds, this pressure subsides, following the arterial pressure.

Relations Between Creatinuria and Acidosis in Diabetes (p. 688).—M. Lauritzen determined the creatin content of urine in a number of cases and found the continued presence of this substance a prognostically bad sign.

Concentration of Acetone in Blood (p. 700).—E. M. P. Widmark introduced a known amount of acetone into the blood and afterwards determined the concentration at certain intervals through the day. A formula was constructed from these data. The average concentration in one healthy subject was 0.1 pro mille, corresponding to an absolute amount of 5.7 gm. To maintain the said concentration, a supply of 5.3 gm. per day was required. This may prove of value in the study of the acetone balance in diabetes.

Internal Treatment for Ulcer of the Stomach (p. 706).—Oehnell advocates invariably medical treatment unless the niche does not disappear, which it did in thirty-one of his thirty-four cases under medical measures.

Cause of Cyanosis (p. 712).—C. Lundsgaard found no relation between cyanosis and the absolute content of oxygen or carbon dioxid in the venous blood. The cyanosis occurs by a subnormal oxidation in the capillaries or in the lungs. The mean value of the nonoxidized hemoglobin at which cyanosis appears is 6 or 7 vol. per cent. Consequently persons with hemoglobin below 25 or 30 per cent. in the blood cannot become cyanotic. Hence a measurement of the amount of nonoxidized hemoglobin in the venous blood in cyanosis will offer data on the degree of oxidation in the lungs. The experiments were done on normal persons by having them breathe into a spirometer until cyanosis occurred.

Secondary Nature of Sciatica (p. 739).—F. Lindsteadt studied 100 cases of sciatica with ninety-one previous histories of localized lesions in the lower extremities or the back, including rheumatic arthritis, hip joint trouble, spinal trouble, flat foot and traumatic foot injuries, varicose veins, flail joints, fractures, static weakness, and gonorrhea. These disturbances, when one-sided, always were localized on the same side as the sciatica. The connection is unmistakable. The primary cause is the local affection which produces direct or indirect static insufficiency, resulting in muscular strain, fatigue and irritation. The strained muscular function is etiologically significant as a cause of neuritic symptoms. Lumbago in many cases could be traced to previous local neuritic symptoms.

Influence of Physical Effort on the Heart (p. 738).—L. Dedichen conducted examinations of the competitors in 50 km. foot-races before and after the races. Of a total of 226 competitors, eight showed an outward displacement of the apex-beat after the race; in thirty, an inward displacement was noted. No dilatation could be traced. Some showed cyanosis. The blood pressure almost always decreased after the race. The urine generally contained varying amounts of albumin immediately after a race. Cardiac hypertrophy was found in fifty of 361 cases, a percentage corresponding to that of men habitually doing hard work. Ski runners give the same general results.

Secretion of Ammonia and Amino-Acids in Tuberculosis (p. 743).—S. Zandren investigated the supposed connection between the function of the liver and the presence of amino-acids in the urine to decide whether the latter is due to an increased toxic decomposition of protein, or to injury of the liver cells. In advanced tuberculosis, we have a state of toxic decomposition of albumin and usually fatty or amyloid degeneration of the liver. In thirteen advanced cases the amino-acid nitrogen was 2.37 per cent. of the total nitrogen in the urine, and there was no visible disturbance of the liver. In thirty-six cases there was fatty or amyloid degeneration of the liver (proved postmortem); the amino-acid nitrogen averaged 4.36 per cent. The conclusion is that a value of amino-acid beyond 3 per cent. of the total nitrogen points to a serious diffuse lesion in the liver cells.

Neurosyphilis (p. 748).—O. Hanssen relates that on admittance to the hospital, 13.5 per cent. of 105 patients with neurosyphilis had a negative Wassermann reaction in the blood but positive in the cerebrospinal fluid. (This was exclusive of the cases with paralysis.) Of the nineteen cases of tabes, the reaction was negative in four in both blood and spinal fluid but in the others it was positive in the spinal fluid. Leaving general paralysis out of consideration, the effects of specific treatment on tabes, hemiplegia, spastic spinal paralysis and other syphilitic nerve and brain diseases, were satisfactory in that paralysis decreased, fits and bladder condition improved, etc. These results are better understood in the light of the parallel studies of the cellular and chemical composition of the spinal fluid. This is elucidated by a detailed account of seven cases.

Diagnosis of Cancer from Tumor Cells in Exudates of Serous Cavities (p. 765).—U. Quensel stains the sediment with his methylene blue and sudan preparation (also used for urine). It may then be possible to distinguish both endothelial and tumor cells. The latter are larger, with vacuoles, and a relatively large nucleus; the whole taking the stain deeper than the other cells. The carcinomatous process may thus be evident in the exudate even when the tumor is too small to be located definitely.

Diagnosis Through Small Particles (p. 770).—A. Josefson recommends puncture and examination of exudates and scraps of different structures, tumors and the organs of the abdominal and thoracic cavity. A puncture-syringe with a fine needle is used on liver, spleen and even kidneys; and the puncture-diagnoses have given valuable results.

Pathogenesis of Tuberculous Peritonitis (p. 779).—L. Melchior discredits the view that the tubes are infected from the peritoneal sac, and considers the infection of the serous cavities secondary.

Pneumothorax Treatment in Pulmonary Tuberculosis (p. 783).—C. Saugman reports 400 cases treated with artificial pneumothorax, with uniformly good results. The treatment is continued from two to four years. The results are tabulated.

Treatment of Tuberculosis of the Larynx with Universal Arc-Light Baths (p. 791).—The patient lies down, undressed, in front of three powerful arc-lights (20 amperes). The room has accommodations for four patients. They get a bath every day, beginning with ¼ hour, the second week ½ hour, the third week ¾ hour and after four weeks an hour's bath every day. N. R. Blegvad reports that a total of 74 patients were treated; in 17 of these the larynx symptoms disappeared, in 12 completely, without remaining signs of active tuberculosis. In 35 cases there was some improvement, in the remainder less. The effect is most prompt with ulcerations. All patients are ordered to remain silent except for whispering. Infiltrations when large are removed by deep galvanocaustic under local anesthesia. Epiglottis is removed when necessary.

Mechanism of Action of Universal Light Baths (p. 796).—C. Sonne experimented on a series of guinea-pigs, exposing them to light rays and dark rays. The curative effect of the light is attributed to the production of antibodies from the long continued elevation of the body temperature. The increased oxidation of the blood may also be considered.

Albumoses in the Blood Under Normal and Pathologic Conditions (p. 810).—E. Wolff developed a method for the

quantitative determination of albumoses in blood, and has applied it in a variety of diseases. He found that 61 per cent. of forty-six febrile patients showed the presence in the blood, and that 69 per cent. of all diseases with fever symptoms gave evidence of albumosuria. At the same time, he does not believe that the presence of albumoses in the blood can be the cause of fever.

Anaphylactic Symptoms After Reinjection of Antiserums (p. 818).—Ustvedt studied the problems of serum sickness and anaphylactic shock on the basis of an investigation of 1669 patients treated with diphtheria antitoxin (horse serum), 1,589 having received no previous serum treatment. Of these 1,589, 35 per cent. developed serum sickness, most of them on the eighth or ninth day. Of 80 previously treated with serum, 77.5 per cent. developed serum sickness, usually between the sixth and eighth day. Of 560 persons not previously injected, 35 per cent. had the eruption after the tenth day. If in patients previously treated with the serum no rash occurs within ten days, no serum illness is likely to occur. A preliminary test subcutaneous infection of 0.5 c.c. has the advantage of showing whether the person in question is hypersensitive to horse-serum or not, so that precautions may be taken, but it does not ward off serum sickness. This developed in 75 per cent. of the 68 thus treated; but 91.7 per cent. of those not given the preliminary injection developed it. He never gives a new and unknown patient the first injection intravenously but intramuscularly. If the case is a serious one, he gives an intravenous dose some hours later.

The Clinical Importance of Examination for Bile Pigments in Serum (p. 827).—E. Meulengracht describes a simple colorimetric method for determining bilirubin in the citrated serum: 1 c.c. is placed in a test tube of the same diameter as that in which the standard color is kept, and is diluted with a solution of 0.9 per cent. sodium-chlorid solution until the dilution has the same tint as the standard color. This is a 1:10,000 solution of potassium bichromate. The dilution figure is the figure which shows how many times the icteric serum can be diluted, before it becomes like normal serum. Bilirubinuria appears only after some period of disease, while the blood examination allows a much finer analysis of the condition at an early stage. In many cases of icterus, urobilinuria is absent.

Number of Red Blood Corpuscles at Different Ages and Under Different Conditions (p. 833).—H. I. Bing fixes the averages at 5.5 millions in men and 5 millions in women. The upper limit is 6.1 millions in men below 30, slightly lower in women. Above 60 the numbers are nearly normal in both sexes, some cases showing figures even higher than normal. This may be due to deficient cardiac power, but alcoholism also accounts for it. Of greater importance is the fact that the number of erythrocytes varies in different parts of the blood vessels and can vary greatly in the different capillaries. The physiologic condition of the extremities thus must be taken into account in clinical counts.

Treatment of Putrid Bronchitis with Neo-Arsphenamin (p. 841).—K. Schroeder treated several cases of chronic bronchitis by the Karell method. In one of these, after five months' illness, intravenous injections of neo-arsphenamin were given in increasing doses (15, 30, 45 cg. at intervals of seven to sixteen days), marked improvement resulting: fever and expectoration ceased, and general health improved. There was no history of syphilis. Similar benefit was realized in a second case.

The Blood Platelets as Indicators of Hemorrhagic Diathesis (p. 845). H. C. Gram determined the bleeding time in various diseases by incision in the ear and wiping off the blood with filter paper every half minute until bleeding stops. In sixty-one persons with normal platelet numbers the time was one and one-half to four minutes. With platelets below 200,000, the period of bleeding is slightly prolonged. Below 100,000 the period is prolonged more than ten minutes. Thus, the bleeding time indicates roughly the number of platelets, and also affords an indication for or against an operation.

Determination of Catalase in Intestinal Diseases (p. 857).—A. Norgaard found the amount of catalase in feces a measure for the admixture of cells in the intestine. A small amount of fecal matter was rubbed on a glass plate and allowed to dry for a couple of minutes, whereupon one or two drops of 3 per cent. hydrogen peroxid were added. Foaming indicates the presence of catalase. After this, a test for blood may be made at once by adding one or two drops of a newly made solution of benzidin. A weak reaction for catalase and blood may be found in normal feces. Pronounced reactions are noted in a great variety of intestinal diseases. The chief value in these combined tests lies in the easy opportunity for continuing them day by day for the same patient.

Intestinal Tuberculosis and Anemia in Consumptives (p. 860).—Krag-Möller, studying 130 cases, found a causal connection between tuberculosis of the small intestine and anemia, and concludes that this is due to a resorption of hemolytic toxins produced by the tuberculous process in the small intestine. The same affection in the large intestine does not result in anemia because of the diarrhea and consequent reduced resorption of the toxins.

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Jan. 12, 1921, 64, No. 2

*Meningococcus Infection Problems. O. Thomson and F. Wulff.—p. 17. Conc'n in No. 3.

Meningococcus Infection Problems.—Thomson and Wulff query why meningococcus infection is so prevalent among soldiers? Why it attacks the new recruits? Why some sicken and others are left carriers? Why the carriers so seldom develop the disease? Why the carriers are more dangerous than the most serious case of meningococcus infection? In a recent epidemic in barracks containing 275 recruits, with 4 frank cases and 31 carriers, the meningococci of the more virulent type were found exclusively in one of the barrack buildings, including the 4 meningitis cases. These more virulent carriers and meningitis cases seemed to be restricted to the east side of the buildings, from which the sunlight was kept off by other buildings. This confirms the experience of others that dark and damp quarters are more liable to develop meningococcus infections than the sunlit and airy, other conditions equal.

Ugeskrift for Læger, Copenhagen

Jan. 20, 1921, 83, No. 3

*Radium Treatment of Uterine Cancer. S. Nordentoft.—p. 75.
Oil of Peppermint for Relief with Gallstones. A. Boggild.—p. 82.
Case of Fatal Hiccup without Fever. J. Kaas.—p. 83.

Recent Progress in Radium Treatment of Uterine Cancer.—Nordentoft quotes Heyman's report of sixty-six cases treated with radium at Stockholm over five years ago, with 28.8 per cent. permanent cures. There were no less than 94 per cent. inoperable cases among the sixty-six. Nordentoft says that roentgen-ray treatment has no such record to present yet, as the improved technic which promises so much has not been introduced for more than a year or two. Recent research of I. Amreich of Vienna seems to offer a means to overcome the danger from necrosis of the tissue next to the radium which is liable when the dose is large enough to modify the farthest ramifications of the cancer. He explains that the cancer spreads from the uterus, fan-shaped on each side, into the tissues of the pelvis so that the shape of the cancer is like that of a butterfly spreading its wings from wall to wall of the pelvis; the rectum and the bladder lying above and below the body of the butterfly. Instead of trusting to the radium in the cervix to reach to the farthest tip of the wings of the butterfly, he uses a smaller dose here, and introduces a second and a third radium tube through a tunnel into the obturator foramen, on both sides. The disadvantages of the small incision for this are counterbalanced, he thinks, by the even, effectual dissemination of the rays. Nordentoft gives illustrations showing waves of rays and their blending and superposed action by this triple technic. The radium is filtered through 7 mm. gold, front and back, while the sides have only 1 mm.; the oval shape of the capsule prevents its slipping out of place. The parametrium and the sacro-uterine ligaments are thus reached from the side, and this method seems particularly promising for unusually corpulent or large persons.